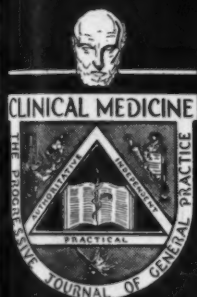


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# CLINICAL MEDICINE

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VOLUME 52

MAY, 1945

NUMBER 5

## Resuscitation of the Drowned Reviewed

By FRANK C. EVE, M.D., Hull, England

IN 1942, Surgeon Commander Gibbens had the courage to cast doubt on the sacrosanct Schafer's method because he found in the Royal Navy that in marked cases of drowning, the normal resilience of the chest, which should cause inspiration, was absent. No air could be induced to enter or leave the chest.

Presumably, the diaphragm had lost its tone so that it stretched limply and the elasticity of the lungs pulled it up into a position of extreme expiration. Obviously, the lungs in such cases must not be compressed by Schafer's method but must be opened as well as closed.

Gibbens turned to the rocking method (Eve, 1932) which did both by gravity, even when muscular tone was lost. He adapted it to use on shipboard, and the method was later adopted by the British Navy preferentially. It is fully described in their First Aid Handbook (1943). It was a great advantage that the rocking could be done by persons with a minimum of training and without much exertion. (See Fig. 1).

### The Older Methods

I need not describe the excellent prone-pressure method of Schafer (1908) which remains the best for a single operator and usually succeeds if immersion is brief, the water is warm and the right technic is applied promptly. Yet in Nordic and other countries the method of Silvester is preferred. Here the victim

is face upwards, the operator compresses the chest with the patient's folded arms and then produces inspiration by swinging them right backwards.

In the toneless warm and limp cadaver (by far the best criterion) this method is found to give better ventilation of the lungs than Schafer and also a wider range of intra-cardiac pressure, especially if the abdomen also is compressed in expiration. The drawback is that it is more fatiguing than Schafer and that a second operator is required to pull out the tongue. But in the usual illustrations the pad beneath the shoulders seems to me far too small. If it is thick enough to allow the head to fall right back I believe the tongue will rarely block the airway.

Schafer's method can be made much more efficient by combining it with Nielsen's. A second operator kneels at the head end and lifts the extended arms, by their folded elbows, during expiration (Drinker). The ribs expand when relieved of the weight above them. I suggest that if the arm-lifting was increased enough to take the epigastrium off the ground. The diaphragm would also be sucked down by the pull of the upper abdominal contents.

Suck and blow resuscitators are now fashionable in U.S.A. but not in England. Their mechanism is rather complicated and needs trained operators. The mask must fit any face without leakage and

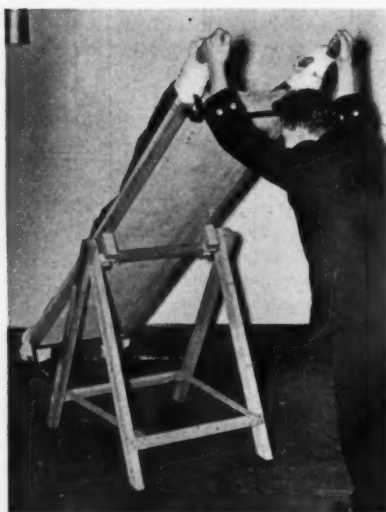


Fig. 1. A photograph taken of the "rocking" method of Eve being applied in the Royal Navy.

they will not work without oxygen and carbon dioxide in adequate supply. This alone seems to make them unreliable for drowning emergencies. I have read the voluminous arguments for and against their use, including the persuasive experiments of G. L. Birnbaum and others. The evidence is centered on ventilation; circulation is scarcely considered and the late toxicity of  $\text{CO}_2$  is not mentioned. I feel that Americans will not long be satisfied with this solution of the problem.

#### The Rocking Method

If a person is placed face downwards, on a see-saw and rocked 1. in the head-down posture the weight of the abdominal contents will push up the diaphragm and force expiration, 2. In the feet-down position the heavy, slippery viscera will suck it down again like a piston in a cylinder. (fig 2).

In practice, the victim has Schafer's method applied without an instant's delay until the rocking stretcher is brought alongside. This consists of a trestle which must be almost a yard high to allow the stretcher to be tilted  $45^\circ$  (half a right angle) each way. It must have some device (chocks, oblique nails or etc.) to prevent it sliding on the iron bar of the trestle. In a metal stretcher, two cords embracing the wire mesh to

the trestle-bar should be enough. On ship-board, a loop of rope passed from two hammock hooks under the stretcher will suffice. Messrs. Siebe Gorman, Westminster Bridge Road, London make a light, folding, combined trestle and stretcher with a timing device.

On arrival, the stretcher is placed alongside the victim who is rolled on to it, the Schafer method of resuscitation is continued while his wrists and ankles are bound to its handles. Then the loaded stretcher is smartly lifted on to the trestle and rocking is commenced with a full head-down tilt which may empty fluid from the stomach or lungs. When this has *stopped flowing* (not before) the feet are tilted smartly downwards, causing inspiration. . . This is continued at the rate of 9 double rocks a minute through  $45^\circ$  each way for a few hours or till normal respirations return. If breathing fails in the ambulance on the way to the hospital, he can be rocked or treated by Schafer's method again. Warmth is essential. Operators should try being rocked; they will feel the air going in and out and will find they do not have to breathe; it is done for them.

#### The Goal of Resuscitation Methods

Our problem is illustrated by a case of sudden death from heart failure. Dr. H. W. Haggard of the United States promptly carried out Schafer's method which at first yielded satisfactory ventilation, but after about 10 minutes no air would go in or out. Presumably the asphyxiated nerve cells had then died, so that the diaphragm had lost all its tone, and the lungs could contract by their elasticity into full expiration: the Schafer method was then useless.

Resuscitation is not merely pumping the lungs, as we were apt to think. It is a trinity of ventilation, circulation and warmth directed to supplying moribund nerve cells in the medulla and elsewhere with circulation of blood (oxygenated

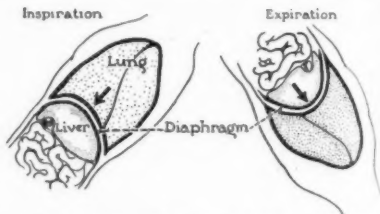


Fig. 2. Diagrammatic sketches by Clinical Medicine's staff artist showing the influence and movement of the viscera during "rocking" resuscitation.

in moving lungs) so that they can restore muscle tone and automatic breathing. We can now understand why Schafer's method rarely fails in Australian surf-bathing where rescue is organised and swift, the sea is warm and the sands (for resuscitation) are almost too hot to walk on. Naval results in cold northern seas are bound to be very different.

Our modern goal is to revive by better methods the cases in which Schafer's method fails, namely when chill and anoxia (oxygen lack) have almost killed the nerve cells, muscle tone is nearly gone, the circulation from lungs to brain is weak or stopped, the lungs have contracted and feel unresponsive to our hands.

The use of CO<sub>2</sub> needs further investigation, with or without oxygen. Certainly it is a safeguard against possible acapnia and is a strong stimulant of the respiratory center at first, but it is a dangerous depressant of nerve cells in extremis and hence its prolonged use may kill more often than it saves.

#### The Criteria of Various Methods

It is useless and misleading to judge methods by testing conscious subjects who have normal muscle tone, who may interfere consciously with respiration and have normal respiratory centers which regulate the piston-stroke of the diaphragm so that the blood CO<sub>2</sub> is kept normal however hard you try to ventilate. The warm, flaccid cadaver is the best criterion; here Silvester's method, which moves ribs and ligaments rather than the diaphragm, ventilates better than Schafer's. Hence it seems that (if rocking is not available) it should always be substituted promptly if Schafer's fails to drive air in and out of the mouth. Always verify this and do not be content with a mere ritual.

**Tests under anesthesia.** A state similar to that of a drowned man is produced by ether anaesthesia during which a period of apnea is effected (by over-ventilation) long enough for testing resuscitation methods. Squadron leader A. E. Pask (formerly an anesthetist) nobly submitted himself to Prof. R. R. Macintosh at Oxford for these tests, with proper recording instruments controlled by experts. The ventilations produced were: For Schafer 340 cc., for Silvester 420 cc. and by "rocking" 580 cc. Confirmatory results were yielded on Mr. Roberts.

**Experiments on the circulation.** Hemingway and Neill at Leeds in 1944 abol-

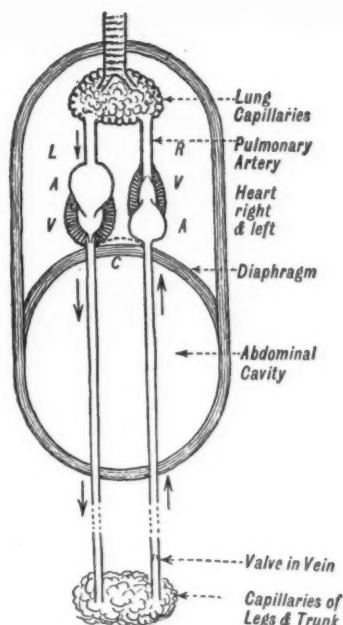


Fig. 3. A diagram of the circulation, which is fully explained in the text.

ished tone and breathing in dogs by section of the upper cord or by pushing nembutal till respiration ceased. They used a pump to replace natural breathing except when Schafer or rocking were being tested. They found that tidal air and oxygen consumption were 78 per cent and 63 per cent worse with Schafer compression than with rocking; also that the output of the heart was 980 cc. per minute by Schafer method, 1220 cc. by pump or rocking.

In the longest (50 minute) test the curve shows beautifully how rocking revived the output of the heart to near normal; it fell again when the pump was resumed. The oxygen in the venous blood was increased from 28 to 47 in that period. They found 45° the best angle for rocking, at a rate of 9 rocks a minute. They advised a spacing of 4 seconds head-down and 3 seconds feet-down for humans, as being better for the heart. I agree with the leading article of the same issue which said that a good case has been made out experimentally for changing over from the Schafer to the rocking method as soon as suitable facilities were available.

**Theoretical considerations.** The "rocked" dog is too short to produce the hydrostatic pressures in the heart and brain which, in a six foot man tilted head-down at 45°, resemble normal blood pressures. Also, it is easier to produce the Schafer effect in a dog on its back than in a man on his face. Moreover the blood pressure in a dog is normally much higher than the human. Hence I submit that if rocking is good for a dog it should be better for a man.

The diagram of the circulation (Fig. 3) is helpful because it can be rocked in the hand and then shows that the columns of blood are propelled by gravity in alternate directions. Reflux is prevented by valves in the veins and heart, so that circulation must follow the arrows. For simplicity, the blood tubes are drawn straight, the two sides of the heart are disentangled, the head and extended arms are omitted: they counterpart the head and extended arms in forming a reservoir of blood to fill the right heart when the feet are rocked down again. If the circulation has failed, we see that in the head-down tilt a hydrostatic pressure of 2½ feet will close the aortic valves and force arterial blood through the coronary vessels (see dotted line) to join the venous blood flowing towards the arms, thus nourishing the vital heart muscle. In a six-foot man, there will be an intermittent congestive pressure of blood approximately normal in the brain and heart. Sir L. Hill found that blood-flow in the brain could be maintained by alternate head-up and head-down postures; hence he considers rocking the

best method of artificial respiration. It is useless to oxygenate the blood in the lungs unless it is circulated to the nerve-cells in the head.

**WARMTH.** I found that sympathetic nerve cells were paralyzed at 18°C. and revived at once by warmth. A Fakir, voluntarily buried for 10 days and apparently dead, was quickly revived merely by abundant hot water externally and bran poultices to the head and heart (H. Price). This should help the drowned who are already wet. He had retained his original trance-rigidity, so that muscle tone was not lacking.

Cold contracts smooth muscle in the lungs and in the walls of blood vessels (e.g. in those supplying nerve cells). Warmth relaxes it and also counteracts shock. Immersion in arctic seas is soon fatal. So that for many reasons we must always promptly apply hot bottles, blankets above and below the patient and also macintoshes to prevent chill from evaporation, especially in wind.

### Conclusions

Schafer's method is simplest and promptest. It should be started at once till a rocking stretcher is available. On present evidence rocking, is definitely more effective on ventilation and circulation. It should save some of the cases in which the Schafer method fails. Silvester's technic has intermediate claims.

81 Beverley Road

(Next month's issue of CLINICAL MEDICINE will contain a "Graduate Course" discussion on various other methods of artificial respiration by well versed contributors.—Ed.)

### Suggestions



Fig. 1. Remove tobacco, gum, false teeth, food, water or secretions from the mouth and throat with the fingers or a cloth. Turn the patient on his stomach to permit fluids to drain out of the mouth and to prevent the tongue from blocking respiration.

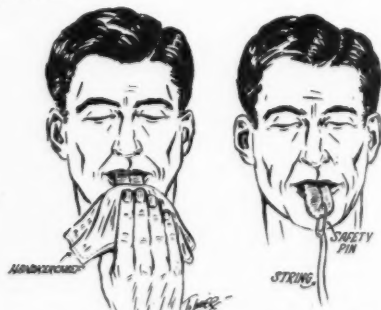
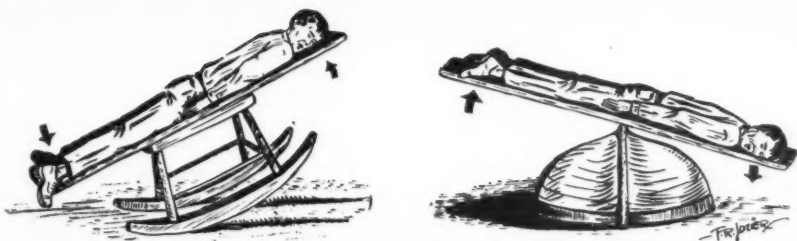


Fig. 2. Pull out the tongue using a handkerchief to prevent slipping. If the patient must remain on his back, the tongue must be held out either with the fingers or by a safety pin or suture and string (see right sketch) fastened to his clothes or taped to his skin.





**Fig. 3. Eve's Rocking Method:** The patient's wrists and ankles are tied to a ladder, stretcher, board, door, oars or other long object. The patient is slowly rocked over a ready or improvised fulcrum so that first the head and then the feet are higher. The patient should be rocked to a 45 degree angle, which is more than the angle shown in these figures. It is also better to have the hands tied above the head, rather than at the sides, as shown here.

The figure at the left suggests a simple, home made device which permits one person to rock a patient for hours without great physical strain. This rocking chair might be kept on beaches and other points where artificial respiration is frequently necessary. (Suggested by Senior Assistant Surgeon James Worrell, U. S. Public Health Service, La Junta, Colorado).

The figure at the right is just to show that a boat or anything at hand may be used effectively.



**Fig. 4.** When nothing is available for the usual "rocking" method, the victim may be rocked by two men who pick up the patient, support him by grasping each other's hands, and tilting the patient as shown at the right. The illustrations do not show the second operator; the angle of the tilt should be approximately 45 degrees.

# Edema Management With High Fluid Intake

By F. R. SCHEMM, M.D.,\* *Great Falls, Montana*

**I**N the hands of those who have followed its published details (1) a regime that includes a high fluid intake has given better results (2) in the management of edema than have accepted regimes that include the restriction of fluids.

## Edematous Patients May Need Water

One of several reasons for a trial of this high fluid regime was the clinical observation that thirst and unmistakable signs of severe dehydration were often present in seriously ill, markedly edematous, cardiac patients. It was recalled that edema fluid was merely an increase in the amount of fluid *outside* blood vessels and body cells. In whatever disease it occurred or by whatever mechanism it reached the interstitial space, edema fluid was only so much extra "salt water" whose presence depended on extra sodium salts and whose disappearance depended on the elimination of these extra "salts" in the urine. *Edematous patients were not "water-logged" but were "brine-logged" and might suffer from a lack of plain water.*

## Rationale

So far as theoretical objections to a large plain water intake were concerned, it was noted that changes in venous pressure and serum proteins followed almost as often as they preceded the development or clearing of edema; and that phenomena such as pulmonary edema, "choked" optic discs (papill-  
edema) and convulsions bore no direct relationship to anasarca, occurred frequently in non-edematous patients and under circumstances that suggested that they were more closely related to injury to capillary cells from lack of oxygen or indeed from a lack of cell water.

It was further recalled that the sodium salts of the edema fluid are an alkaline mixture (pH 7.4) of about five parts of sodium chloride to one part of sodium bicarbonate, which remains inertly stored as the solute of edema fluid until its bicarbonate fraction is used up by the ever-forming metabolic acids or by ingested acids; and that acidification incites the kidneys to balance the threat to the hydrogen ion concentration of the body fluids by the elimination of neutral or acid sodium salts, i.e. acidification "mobilizes" sodium for elimination in urine water.

On the basis of such considerations it

appeared rational to try a regime that limited the ingestion of sodium, encouraged its mobilization, and provided ample water for its elimination.

## The Treatment Routine

1. The administration of a large amount of water, usually from 3000 to 5000 cc. daily to ensure an adequate amount of water reaching the kidneys for the elimination of sodium salts. Intravenous supplements of isotonic dextrose are often given to bring the intake up to the amount desired, as estimated on water balance and renal function principles which occasionally indicate a need for from 6-8 liters the first few days and from 4-5 liters daily thereafter.

2. The use of a "neutral" diet which regulates the ingestion of sodium so that such large amounts of water may be given safely and with benefit.

The diet yields reduced amounts of salt and sodium or both in order to limit the material essential to edema formation (sodium) and to reduce the amount of sodium salts requiring elimination in the urine water.

The diet is so constructed that at each feeding the basic ash of the unsalted food is balanced by enough acid ash to yield a net reaction that is neutral or slightly acid. Within limits, this diet reaction is of more importance than the total amount of sodium of the diet, for it prevents the neutralization of the metabolic acids which physiologically "mobilize" sodium for elimination by the kidneys.

To guard against errors in diet and to hasten mobilization of sodium by the metabolic acids and the acid ash excess of the diet, small amounts of acid drugs are usually given (1.5 to 4.0 grams of ammonium chloride, 2 to 4 cc. of dilute hydrochloric acid).

The slight excess of acid ash in the diet is achieved by properly balancing eggs, meats, fowl, fish and cereal foods which yield an acid ash excess against milk, all vegetables, and all fruits (except prunes, plums and cranberries) which yield a basic ash excess. It is necessary, of course, to avoid inadvertent ingestion of sodium or excess basic ash from sources other than the regular feedings of the diet.

## References

1. Schemm, F.R.: *Ann. Int. Med.* 17:952, 1944.
2. Schemm, F.R.: *Ann. Int. Med.* 21:937, 1944.

\*From The Great Falls Clinic.



**Skeleton Outline for Neutral Diets****GENERAL DIET**

Limited 24 hr. Maximum	Basic-Ash Foods	vs.	Acid-Ash Foods	No Limit 24 hr. Minimum
1 Pint	Milk		Eggs	2
2 Servings	Vegetables		Meat, fish, fowl	1 Serving
2 Servings	Fruits		Bread or cereals	5 Slices or servings

except: Prune, plum, cranberry

**INITIAL DIET**

6 Cups	Six small feedings		One item per cup
	Milk or	Egg or	1
6 Servings	Milk and	Bread or	2 Slices
	Cream (1/3)	Cereal	1 Cup

**Precautions for "Neutral" Diets**

1. No salt or soda to be used in the cooking or at the table.  
Small amounts of ammonium chloride may be used as a salt substitute.  
Use no other salt substitute, such as "vegetable" salts (Eka, etc.).
2. Obtain unsalted sweet butter or wash butter free from salt.  
Obtain unsalted bread from baker, or make at home.  
Unsalted salad dressing must be made at home.
3. Take no salted appetizers or salted foods such as salted nuts, potato chips, sardines, olives, pickles, relishes; no cheese except unsalted cottage cheese; no smoked or salted meats or fish such as canned salmon or tuna, bacon (unless par-boiled), ham, lunch meats, sausage, salt pork.
4. For "gas" or "indigestion":  
Take no bicarbonate of soda and no alkali powders or tablets (Turns, etc.)  
Use calcium carbonate only.  
Avoid cabbage family, turnips, rutabagas, peppers, radishes, onions, spices, greasy fried foods and pork.
5. For extra liquids:  
Take none of the vegetable juices or fruit juices on the restricted list, or salted bouillon.  
Use only well diluted plum, prune or cranberry juice, or water with fruit flavoring (such as Kool-Aid) or unsalted chicken or beef broth.

**Sample Hospital Orders**

A. For massive anasarca with no great mechanical embarrassment from the edema and no great trouble in eating or drinking:

Orders: 1. Initial neutral diet.

2. Intake to 4,000 c.c. daily.

3. Diluted HCl M. 5 in a glassful of water every hour until 7:00 p.m.

4. Ammonium chloride gr. viiss (enteric coated) 1 tablet t.i.d.

(or 1 tablet after each of the six feedings).

(5) If needed to bring intake to 4,000 c.c., 500—1,000 c.c. of 5 per cent glucose in distilled water i. v.

B. For massive anasarca with marked embarrassment from the edema and with inability to take significant amounts of liquids:

Orders: 1. Water orally as tolerated with 2 drops of diluted HCl to each glass.

2. 500 to 1,000 c.c. 5 per cent glucose in water i.v. at 7 a.m., 1 p.m., and 7 p.m.

3. Mercupurin 1 c.c. i.v. second hospital day.

(4) Begin orders under A. as soon as possible.

It is assumed that appropriate methods for the treatment of the primary disease and its symptoms are in force. Total intake and output are routinely recorded for 24 hour periods terminating just before breakfast, at which time the patient is weighed daily when possible.

Only when the dietitian and the nursing force are familiar with the details of the régime and the precautions to be exercised, will simple orders such as those above be sufficient to put the régime into effect.

# Dolorimetry: Pain Measurement by Instrument

By L. J. B. GLUZEK, M.D., St. Petersburg, Florida

Dr. Gluzek gives some very interesting facts and figures on deep sensibility and on "metric" pain values that may help to unveil the age old mystery of pain through the use of the instrument, the dolorimeter, recording a standard measurement of pain.

**A** CORNER STONE of scientific labor, an age old conviction, that things are as they appear, was proven by Copernicus not to be necessarily true. Time does not exist except in our inner sensibility. A standard instrument, a time piece was needed to render time public property.

Pain is even more subjective and is only incidentally experienced, it is small wonder therefore, that many a patient claims exclusive knowledge of his suffering. A small army of scientific physicians investigated pain and ascertained that it is in close relation with the sensitivity of the patient. Lately, Bocke, Foerster, Fulton, Kennedy, Livingston, Penfield, Tilney, Wilder, Wilson and others studied pain from specific angles and enlightened certain aspects of this most vivid symptom. In research, pain had a unique standing, that of an illegitimate orphan, because it belongs as a sensation to the domain of the physiologist, however it may denote pathologic change.

Through dolorimetry, deep sensibility and pain attained objective expression. Indeed not only scientists, but every research minded practitioner might study the relations of pain and disease and might augment our knowledge with new discoveries.

The suffering from pain is a thalamo-cortical, and the full fledged sensation is a conscious process. Dolorimetry, as does every sensory examination, requires the patient's co-operation. One should not divert, but focus the attention on it. The dolorimeter operates on the principle of opposing forces: a pressure to induce pain, then another pressure to alleviate this pain. The counter pressure serves also to check the indications of the patient. Using this test the examiner is convinced that he has obtained the true sensitivity determinant.

It seemed reasonable that an actual pain might be as well balanced, alleviated by induced pressure-pain. Thous-

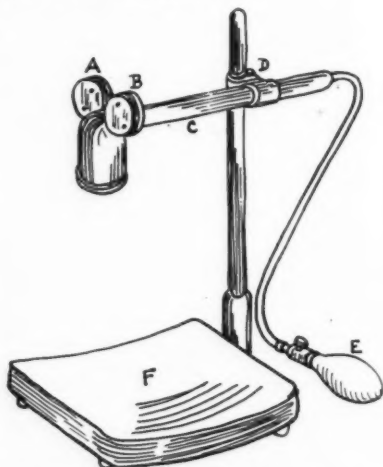


Fig. 1. The Dolorimeter: (A) Commutator gauge; (B) Inductor gauge; (C) Air chamber; (D) Three-way adjustment screw; (E) Air pump; (F) Leg rest.

ands of tests proved that this is so. The artificially created tension which eliminates the spontaneous pain is its gram-pressure equivalent, its "metric-value." Comparing this (objective) "metric-value" with the patient's pain threshold (also expressed in grams), the doctor might calculate the (subjective) "hurt-value" of the pain.

Dejerine, Schilder, Stengel, Schaffer and others furnished proofs and dolorimetric investigations indicate that the deep sensory receptors—pathways—centers are distinct from those of the superficial.

The cortical deep-pain center is probably in the parietal lobe (the gyrus supramarginalis). Neuroanatomy does not know of any connection between the left and the right deep sensory tracts nor between the thalami, therefore, a deep pain impulse from the appendix could not meet a pressure-pain impulse from the left tibial periosteum, before it would reach the cortex. As it was established by dolorimetry, that a pain is best overcome (temporarily eliminated) by another pain which is contralaterally generated, one has to accept, —until proven differently — that the

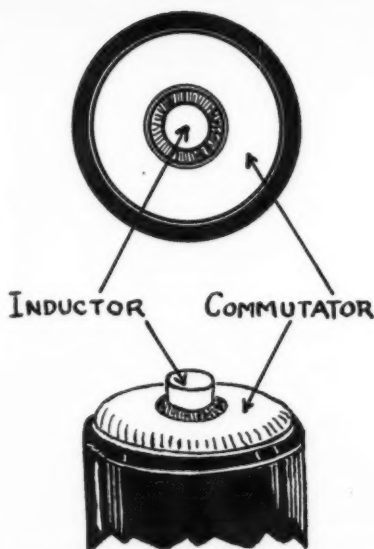


Fig. 2. The pressure surface of the Dolorimeter. Sketch is approximately full scale size.

measure of pain is taken in the cortex.

Dolorimetry answers many questions of general interest. Are females more sensitive? Yes, but there are many exceptions and maybe the fair sex deserves another trial, indeed they ought to be measured again. After all their war activities—who can tell? Do fever, high tension, nervous states etc. influence sensibility? Do analgesics, sedatives raise the pain thresholds? They do in about 70% of the cases. The effect of treatments, of medications on pain is also measurable.

#### The Dolorimeter

Reliable measurements of the sensitivity of a person and of almost any pain experienced at the time of the examination are obtainable by the dolorimeter (Fig. 1.)

The double pressure surface of the instrument (Fig. 2.) is laid on the middle third of the shin bone's flat side and, in a leisurely way, pressure (500 grams every 10 seconds) is applied by the inductor, the central metal disk, until the patient indicates pain, a mild dull ache. Pressure is then exerted on the commutator, the rubber disk, until the previously induced pain is said to be relieved. By opening the main air valve this second pressure is lifted whereby the induced pain-pressure becomes re-activated and the patient again feels

the ache. The pressure registered on the inductor's gauge is the gram equivalent of the patient's deep pain-threshold. The employed commutator-pressure equals the force needed to alleviate the threshold pain. These two measurements constitute the sensitivity determinant of the patient.

#### Classification

To label a patient hyper, normal, or hypo-sensitive the doctor usually employs ingenuity. In most instances, this subjective judgment is arrived at by observation of reactions, of behaviour, and at times it is but instinctive.

Dolorimetric tests permit an accurate classification which discloses the patient's relation to noxious stimuli. The determinant might be numerically expressed or by word symbols:

##### 1.

**Early**—pain indicated near 500 grams inductor pressure.

**Youngish**—pain indicated near 1000 grams inductor pressure.

**(Mean) average**—pain indicated near 1500 grams inductor pressure.

**Average**—pain indicated near 2000 grams inductor pressure.

**Late**—pain indicated near 2500 grams inductor pressure.

**Very late**—pain indicated at 2700-3000 grams inductor pressure.

**(Abnormal) dull**—only pressure indicated at 2700-3000 grams inductor pressure.

##### 2.

**Balanced**—commutator pressure is  $\frac{1}{3}$  to  $\frac{2}{3}$  of inductor pressure.

**Shortened**—commutator pressure is less than  $\frac{1}{3}$  of inductor pressure.

**Elongated**—commutator pressure more than  $\frac{2}{3}$  of inductor pressure.

Accordingly, if a patient indicates pain on 900 gram inductor-pressure and relief on 700 gram commutator-pressure his determinant will be "9/7" or "youngish-elongated" indicating, that he suffers pain from milder than average stimuli and that his pain sensation is of a longer than normal duration. A "youngish" pain threshold, as the symbol intends to express it, means a normal responsiveness in youth, as does "late" in old age.

Sensitivity as an indicator of health and disease is probably most advantageous if it can be labeled "average-balanced," or cc "15g," however it might be important, that one should feel pain earlier before one is fully developed and vice versa.

Above classification was arrived at and confirmed by about 45,000 dolorimetric tests taken on more than 16,000

persons. However, only a few hundred American negroes and very few of the other colored races were tested thus far. Professional boxers and others who are often exposed to bodily punishment should be also investigated, as they might turn out to belong to the "dull" class. Otherwise, one discovers only very rarely a "dull" healthy person. The cause of such fundamental analgesia is not yet known. The "shortened" pain sensation is possibly due to central interference (fronto-thalamic impulses?). Idiopathic epileptics have, as a rule, relatively higher pain thresholds with "shortened" sensation.

Sensitivity can easily be influenced for short periods. However, there is no drug nor treatment known which would change it permanently.

#### Metric Pain Values

Pain is measured on the contralateral tibia by inducing pressure-pain, then by increasing this pressure until it overcomes the patient's pain. Usually on lifting the pressure, the patient again starts to feel his pain. It is of advantage to measure the incidental thresholds of the patient before measuring his pain. For instance in a case of appendicitis, one may reach the pain threshold on the right tibia by 1200 gram and only by 2000 gram on the left. This is in itself indicative of a severe painful condition on the right half of the body. At 2000 g on the left, the patient, says that his leg hurts a little, but his abdominal pain is worse. At 2400 g the patient indicates that both pains are about equal. At 2700 g patient declares that his pain ceased, or that it is much relieved, but his leg hurts badly. If one releases the inductor, suddenly the patient will feel for a fraction of a second a more severe pain in his abdomen and then his appendix will hurt as before. The "metric value" of this appendicitis pain is 27.

With but few exceptions, pains and aches accompanying lesions of consequence measure 1500 g or more. Ureteral colic, some neuralgias rank among the highest with their dolorimetric values. Agonizing pains should not be measured. If the pain impulses are over-whelming for the individual, the shocking pain-impact in the thalamus disconnects all the sensory conduction to the cortex obliterating consciousness and with it pain.

The pulse rate usually diminishes under the influence of threshold value pain and an attack of tachycardia might be as well controlled by induced pressure on the tibia as by pressure on the vagus nerve.

In a diagnostic way, one may employ the dolorimeter in a case of acute abdomen: as 2700 g. pressure is exerted through the inductor the abdominal pain is alleviated and the rigid muscles relax permitting localizing palpation.

Pain is in close relation with (locally) increased tension, therefore a 3000 g. pain, a pain of very high metric value, does not necessarily indicate extensive pathologic changes, it signifies rather the intensity of the process.

#### Summary

The sensitivity determinant obtained by dolorimetry classifies and qualifies with accuracy the patient's relation to noxious stimuli. The determinant might be expressed by the measured gram pressure values or by descriptive symbols.

The intensity of a pain measured by the dolorimeter is designated by the gram pressure equivalent of the inducted counter pain. Thus if a pleurisy pain is temporarily obliterated by 2100 g inductor-pressure, its dolorimetric value is 21. The intensity of the pathologic change is in close relation with the dolorimetric value.

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### COMING ARTICLES

Empyema

Tropical Diseases You Should Know

Peritonoscopy

Common Anemias

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Practical Points in Psychiatry

Undulant Fever

The Acute Surgical Abdomen: Diagnosis and Choice of Procedure After the Abdomen Is Opened

# Some Aspects of Capillary Physiology

By T. E. BOYD, Ph.D.,\* *Chicago, Illinois*

**D**ISCUSSIONS of the circulation usually give most space to the heart, the arteries, and the veins in the order named. It is easy to forget that the sole function of these structures is to maintain an adequate rate of blood flow through the various capillary beds. It is in the capillaries that the essential business of the circulatory system is carried on. This is the transfer, through the capillary walls, of water and of various dissolved substances, of which the most urgent item is oxygen.

The capillary walls are freely permeable to all plasma constituents of small molecular size. Normally, dissolved oxygen is more concentrated in plasma than in tissue fluids, and therefore moves outward by simple diffusion. The known rates of transfer of other solutes (dissolved substances) also can apparently be accomplished by simple diffusion.

The plasma proteins, being large molecules, can escape from an undamaged capillary in small amounts or not at all. The molecule of albumin, smallest among the plasma proteins, is still more than 2000 times as heavy as a molecule of oxygen and 350 times as heavy as glucose. As in a sieve, gravity causes the smaller particles to fall through the meshes while larger ones are retained, so blood pressure in the capillaries tends to filter water, and with it the dissolved substances of low molecular weight, from plasma out into the tissue spaces (See illustrations in the pictorial section).

When one considers that the capillary walls are permeable to water, and that they normally are distended by the pressure of fluid within them, the maintenance of blood volume is a remarkable fact. If there were no force to counteract filtration pressure, the fluid of plasma would quickly be lost into the tissues and the circulation would fail from lack of venous return to the heart.

That this does not occur is due mainly to an osmotic force exerted by the plasma proteins, tending to retain and to attract water. This force can be measured. If an experimental set-up is prepared in which normal human plasma is separated from physiological saline solution by a membrane, permeable to all constituents of both fluids except the

plasma proteins, water is drawn from the saline solution into the plasma. The original volumes of the two fluids can be maintained without change only if the osmotic action of the plasma proteins is balanced by some counter force. This can be done by subjecting the plasma from the beginning to a hydrostatic or other pressure greater than that acting on the saline solution. The difference must be equivalent to about 26 mm. of mercury. We, therefore, say that the plasma proteins exert an osmotic attraction, or pressure, of this magnitude. In the undamaged capillary, it is constantly acting to retain water in the plasma or to draw water into the plasma from the tissues. This influence of the plasma proteins is fundamental for any understanding of capillary physiology. It has several consequences:

First, the constancy of the blood volume in health means that the net movement of water out of the plasma, over an average 24-hour period, must be exactly the same as the volume absorbed into the blood from the gastrointestinal tract; however, blood volume remains constant only so long as the mean filtration pressure in the capillaries is balanced by the osmotic pressure of the plasma proteins. This does not mean that a state of equilibrium exists along the entire length of each capillary. In a given capillary, the filtration pressure becomes progressively less from the arterial to the venous end.

Direct experiment seems to have proven that in a given capillary (systemic) at the level of the heart, water is lost from the plasma at the arterial and taken up at the venous end. Somewhere between these points a state of equilibrium does exist, and in the capillary as a whole the net gain or loss of water may be zero. In capillaries below the level of the heart, gravity adds to the filtration pressure, and there tends to be a loss of water to the tissues.

## Edema After Standing

Thus when a man shifts from the recumbent to the upright posture and stands quietly for a time, fluid leaves the blood and passes into the tissues of the lower extremities. The plasma volume may thus be reduced by about 1/8 in healthy subjects.

It is well known that cardiac patients,

\*Professor of Physiology, Loyola University School of Medicine.

with an elevation of systemic venous and consequently of capillary pressure, tend to develop an edema of the lower extremities on standing. This appears to be merely an exaggeration of the normal effect.

#### Importance of Proteins

Second, since the osmotic pressure of the plasma proteins is largely responsible for the maintenance of blood volume, it is a primary factor in the maintenance of a venous return to the heart.

#### Shock

Third, the plasma proteins can be effective in this manner only so long as they are retained in the circulation, i. e., so long as the capillary wall remains impermeable to them. While shock is still a controversial subject, it seems certain that some types of shock at least are the result of capillary damage and resulting fluid loss. It is not that the damaged capillaries have suddenly become permeable to water for they are normally so, but because the escape of protein into the tissue fluid leaves no force to oppose filtration.

Fourth, the osmotic effect of the plasma proteins is directly proportional to their concentration, i. e., to the number of molecules of protein per unit volume of plasma. Hence, depletion of plasma proteins, from whatever cause, favors loss of plasma fluid to the tissues. Likewise, the dilution of plasma proteins by transfusions of saline solution cannot bring about a sustained increase of plasma volume. Transfused fluids will remain in the circulation only if they contain substances capable of exerting the same type of osmotic pressure as the plasma proteins. Hence, all the experimental work with artificial plasma substitutes containing substances of high molecular weight,—gum acacia, pectin, gelatin, and so on.

It may be noted that in the capillaries of the pulmonary circulation there is little tendency for any filtration of water outward to occur under normal conditions. That is because the blood pressure in them is everywhere less than the osmotic pressure of the plasma proteins. The same probably is true of the peritubular capillary plexuses in the kidney.

On the other hand, filtration pressure is high in the capillary loops of the renal glomeruli, approaching the arterial pressure, and large volumes of water are filtered from these loops into the lumen of Bowman's capsule.

Wherever any external pressure is exerted on the capillary walls, tending to compress them, this external pressure acts to oppose filtration and to reinforce the action of the plasma proteins, (thus explaining the benefits of elastic bandages—Ed.) When a muscle is tonically contracted, such an external pressure is applied to the blood vessels contained in it.

When a man is placed in the head-down position, gravity increases filtration pressure in the capillaries of the brain, but at the same time increases to an approximately equal degree the pressure of the cerebrospinal fluid. These two mechanical effects largely cancel each other so far as transfer of water from plasma to brain tissue is concerned. This compensation occurs because the structures concerned are inclosed in a cavity with rigid walls. Where only soft tissues separate a capillary bed from the outside air, gravity influences filtration to a much greater degree. Even in loose subcutaneous tissues, local accumulation of fluid will build up a counter pressure which tends to check further filtration.

The above discussion is, I believe, sound in principle, but it is oversimplified for brevity. It has assumed, for example, that the tissue fluid outside the capillaries is normally protein-free, an assumption which may not be strictly true. Again, while anatomically the capillary proper is a tube the wall of which is a single layer of endothelium, there is a gradual rather than an abrupt transition of structure from arteriole to capillary and from capillary to venule. There probably are variations of permeability as the wall structure changes. It is certain that the caliber of the capillary, and the pressure within it, may be changed by active contraction or relaxation of the vessels upstream. Whether the capillary actively changes its caliber or not is a controversial question upon which I prefer not to venture.

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Medicine is the only profession that labors incessantly to destroy the reason for its own existence.—*Bryce, 1914.*



# Capillary Circulation: Its Clinical Application

By R. L. GORRELL, M.D., The Health Unit, Trinidad, Colorado

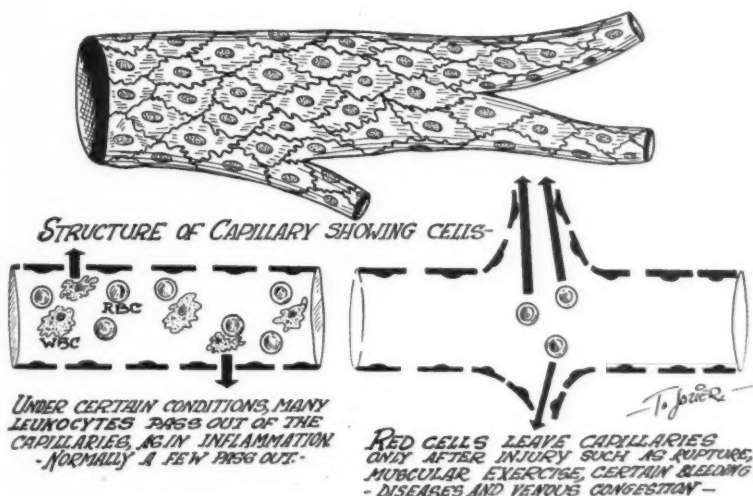
**I**F YOU know capillary circulation, you will find that your diagnosis and treatment are improved. For example, the common clinical problem of edema becomes simple when considered from the standpoint of the tissues and the capillaries.

The first four illustrations (Fig. 1 to 4) diagrammatically portray the anatomical structure and normal function of the capillary. Fig. 5 to 10 illustrate the various causes of edema, the appearance of the patient and what methods of treatment have proved effective.

Edema results from: 1. Increased capillary pressure (Fig. 5 and 6). 2. Decreased osmotic pressure due to low blood proteins (Fig. 7 and 8). 3. Damaged capillaries following such conditions as acute glomerulonephritis (Fig. 9 and 10). 4. Lymphatic obstruction (Landis classification).

## Contributing Factors

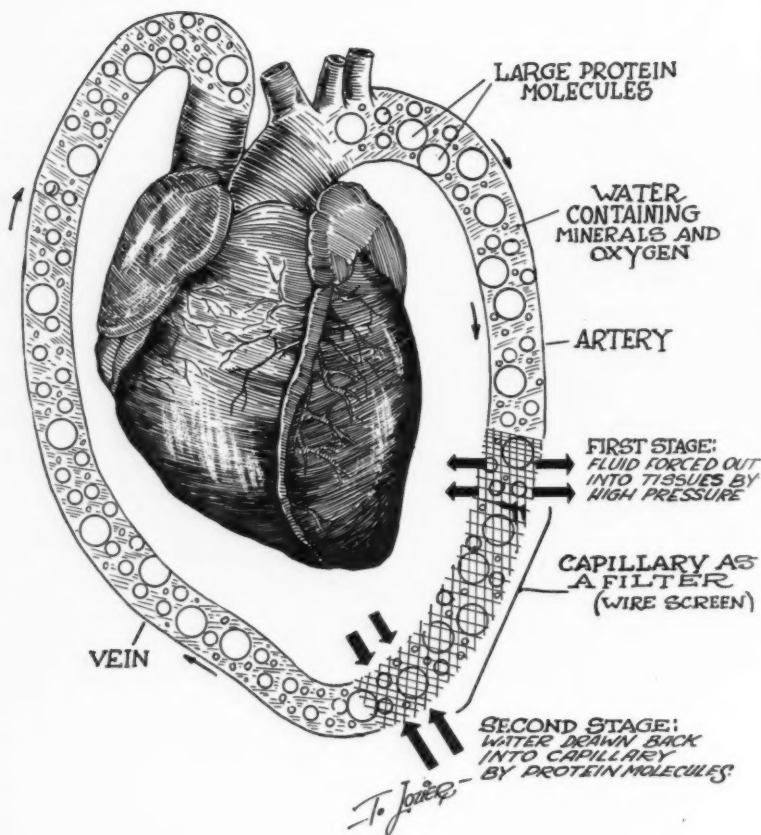
1. Standing: The normal person will find slight edema in his legs after prolonged standing or sitting (as in a bus) because the hydrostatic pressure of the long column of venous blood increases the capillary pressure and forces more fluid into the tissues. Walking dissipates this edema.
2. Heat: Hot weather increases any type of edema.
3. Varicose veins: Varicose veins tend toward the production of edema.
4. Salt: Sodium chloride, sodium bicarbonate and sodium bromide cause fluid to be retained in the tissues. Landis suggests that if severe restriction is desired, salt poor butter and bread should be prescribed, no salt should be used in cooking, no alkaline waters should be consumed and the following foods avoided: Celery, bananas, cornmeal, crackers, dates.



**Structure of a Capillary**

Fig. 1. Top: The structure of a capillary showing the single, thin cells which make up its walls. Left, below: Normally, a few white blood cells pass out into the tissues; under certain conditions, such as inflammation, many leukocytes pass out to the tissues. Right: Red blood cells rarely enter the tissues except after injury, such as rupture, muscular exercise, certain bleeding diseases and venous congestion.

# Capillary Circulation

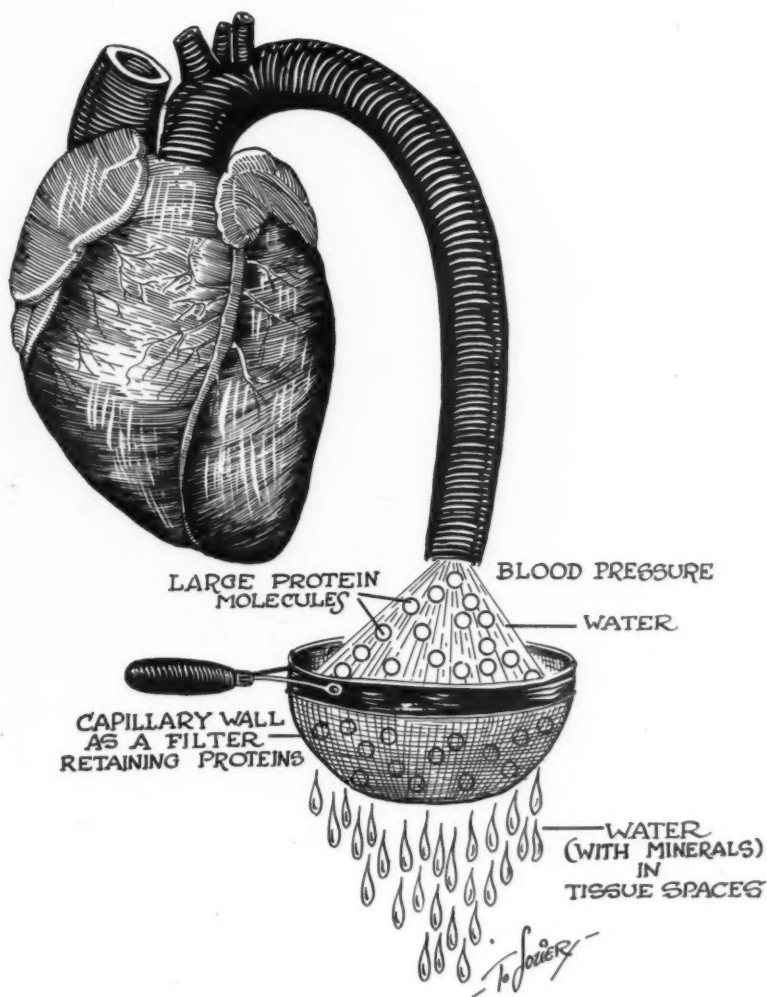


## Capillary Action

Fig. 2. The capillaries are represented as filters (wire screens) which retain the large protein molecules but which permit the fluid constituents of blood together with minerals to enter the tissues.

In the first, or arterial, section of the capillary the fluids are forced out by the high capillary pressure (represented by the two arrows). This pressure rapidly drops along the capillary toward the venous end. Fluids are attracted back into the capillary by the osmotic pressure of the large protein molecules (represented by the lower arrows). Normally, these forces are approximately equal. When one does not balance the other, edema results, as shown in figures 5 to 10.

## Capillary Circulation

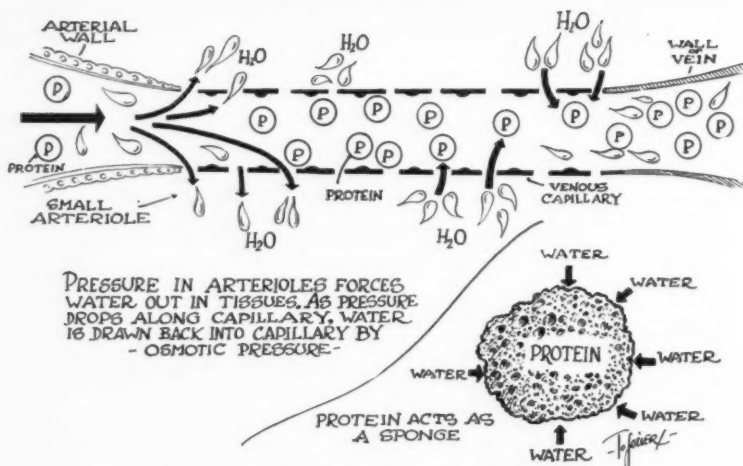


### Capillary Function

Fig. 3. The first function of the capillaries: Another unscientific but effective method of showing the filtering function of the capillaries with retention of the protein molecules inside the capillary wall.

(Drs. E. M. Landis of Harvard and T. E. Boyd of Loyola contributed several useful ideas to this section).

# Capillary Circulation



## How Blood Pressure and Volume are Sustained

Fig. 4. Left: A diagrammatic representation of this normal balance of forces in the capillary. Right: The large protein molecule represented as a sponge which attracts water. This analogy is not technically correct, but may help to grasp the idea of the "pull" or attraction exerted by the protein through the capillary wall on the fluids in the tissues.

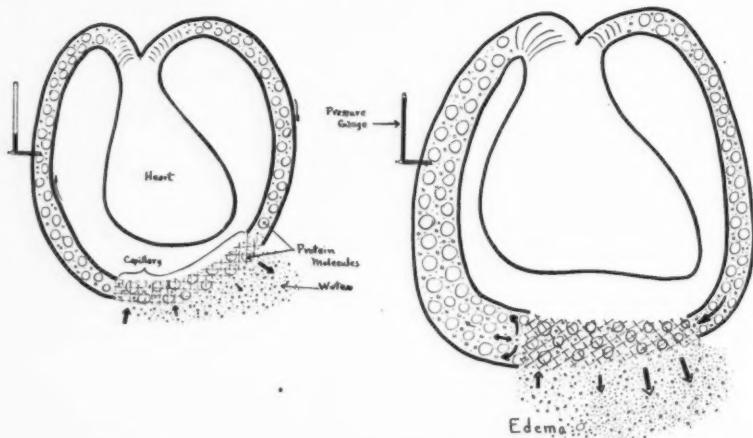


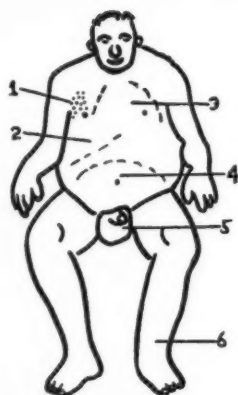
Fig. 5. Left: A normal heart and normal capillary circulation. The capillary pressure forcing fluids into the tissues is balanced by the osmotic pressure of the proteins in the blood. The small gauge indicates that the venous pressure is normal.

Right: A decompensated, enlarged heart is associated with increased venous pressure (note height of pressure indicated on gauge). Pressure in the capillary is much increased due to the back pressure in the vein being transmitted to the capillary.

This increased capillary pressure forces more fluid into the tissues than the osmotic pressure of the blood protein can pull back, fluid is left in the tissues and eventually becomes visible as pitting edema.

Increased venous pressure and dilated, superficial veins (at or above the level of the heart) are diagnostic of cardiac decompensation.

# Capillary Circulation



Rx

Rest

No Salt

Digitalis

Salyrgan

Fluids as desired

Balanced Diet



Fig. 6. A sketch of a patient with advanced cardiac decompensation and marked edema due to the above cause (adapted from Meakins). The edema is not present in the face or neck. 1 = Fluid in chest, right hydrothorax; 2 = Enlarged liver due to chronic passive congestion; 3 = Enlarged heart; 4 = Upper level of ascites; 5 = Marked edema of genitalia; 6 = Marked edema of ankles.

Treatment: The small figures indicate value of rest in treating edema. When the patient is standing, the long column of blood in the veins increases the pressure in the capillaries of the legs, forces more fluid into the tissues and thus accentuates the edema. When the patient is lying down, this hydrostatic pressure is relieved, and the edema tends to decrease promptly.

Salt increases any type of edema, due to the sodium causing retention of fluid in the tissues. Edematous patients should not receive sodium bromide, sodium bicarbonate or salt substitutes containing sodium.

Full doses of digitalis relieve the decompensation and the edema. Salyrgan or Mercupurin intravenously result in a marked outpouring of urine.

Should the cardiac patient be restricted as to liquids? The most sensible rule is to permit him to drink as much as he wishes, remembering that water itself is a diuretic, that water is necessary for proper body functioning (water in the tissues, edema, is not available for use and thus an edematous patient may be dehydrated) and that water is not retained if sodium is restricted.

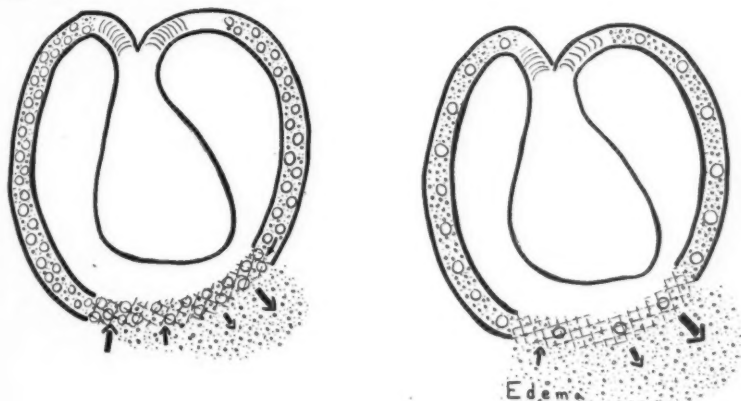


Fig. 7. The normal capillary circulation is shown on the left. On the right is diagrammatically represented the formation of edema due to insufficient protein in the blood (low serum proteins). Insufficient osmotic attraction by the few protein molecules cannot withdraw all the fluid from the tissues.



Fig. 8. How the clinical patient with edema due to low blood proteins appears. The edema includes the face, as contrasted with the cardiac edema. Ascites (1) and hydrothorax (2) are indicated.

The causes of depleted protein are indicated by the arrows: Albumin may be lost in the urine (nephrosis), protein may be lost by repeated aspirations of ascites or hydrothorax, or from burns or hemorrhage; insufficient protein in the diet occurs in patients on "ulcer" or "colon" diets, surgical patients whose diet has been limited and patients with peculiar ideas about diets. Persons with advanced cardiac decompensation often have a low protein intake; the resultant lowered blood proteins accentuates the cardiac edema.

Treatment: Again, the patient is told to rest, no salt or sodium compounds are given, a well balanced diet is prescribed (with special emphasis on meat, eggs, cheese and other protein foods). Whole blood, plasma or albumin (human) are given intravenously to restore blood proteins. Blood transfusions are preferred if the patient is anemic. Occasionally, acacia is very effective when other measures for nephrosis fail. Patients with nephrosis are often benefited by thyroid extract, given to tolerance. All patients may be aided by vitamin B complex.

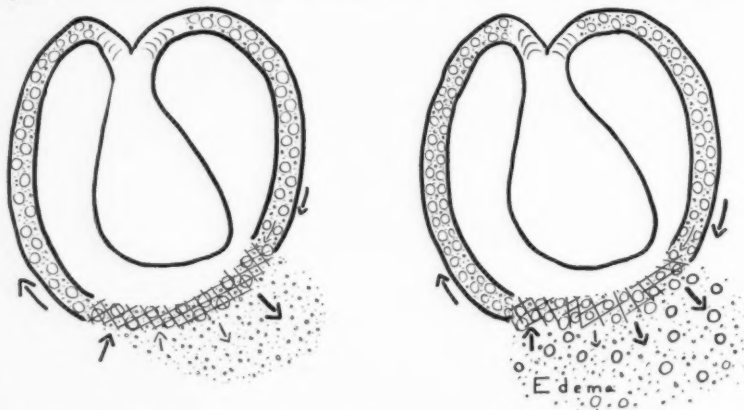


Fig. 9. The third common cause of edema is capillary damage. On the right are shown diagrammatically, the injured capillaries permitting the large protein molecules to pass out into the tissues. The pressure in the capillaries forces fluids out but the normal osmotic pressure of protein to force fluids back into the capillaries is partially lost because a portion of the protein is outside the capillary.

Notes. The patient with nephritic edema has edema of both eyelids as a prominent clinical sign. Ascites and other areas of edema appear later.

Lymphedema, due to obstruction of the lymphatics, is not shown as the cause of edema is usually obvious (a scar across the regional lymphatics, cancerous extension into the lymphatics, filariasis with obstruction of the lymphatics of the leg has occurred in some thousands of Marines).



# Vitamin A in Hypertension

By ASHLEY POND, M.D., and ALBERT M. ROSEN, M.D., Taos, N. Mex.

A FEW investigators in the United States have been doing laboratory and clinical research on the use of vitamin A in hypertension for several years. We were interested in this work since reading early reports on the subject by Govea-Pena and Villaverde of Havana, Cuba.

For our study, we took a small group of patients with essential hypertension, eliminating any hypertensives with a known cause, and placed them on 200,000 units of vitamin A daily. We advised moderation in the matters of rest and diet, but permitted no other medication. The effect of the diet and rest was discounted from our evaluation of the treatment because all of these patients had previously followed such advice in the management of their hypertension.

A check of blood pressures weekly over a period of up to two years showed that in almost all cases there was a gradual and definitely marked fall in blood pressure. In some cases, we experimentally discontinued the drug and found that blood pressure rose again at once. When treatment was again resumed, the pressure fell as it had previously. In our small series of cases, there were no side effects or untoward reactions to these large doses of the vitamin. This coincides with findings of others using similar doses in treatment of laboratory investigation with animals.

Our first report, including data gathered up to January, 1944, was published in the April, *Rocky Mountain Medical Journal*. Newer cases, using the same treatment since that time, have responded in the same satisfactory manner to treatment and we are continuing to use this method of care as patients become available.

The manner in which vitamin A brings about a lowering of excessive blood pressure is not as yet known. Pena found that some of the hypertensives he treated had a definite hypovitaminosis and, yet others, who responded just as favorably, showed normal serum Vitamin A values before starting treatment.

Wakerlin, who produced experimental renal hypertension using the Goldblatt technique, and found that the large doses of vitamin A produced striking reductions in the blood pressure, used dogs previously determined to have normal serum vitamin A levels. It has been suggested that the fact that vitamin A

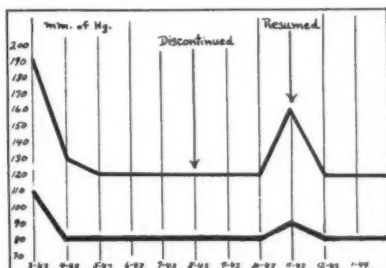


Fig. 1. Blood pressure chart of case 1.

in high dosage raises the urea clearance of dogs 40% above normal may indicate that the vitamin may disturb the pathophysiologic mechanisms produced by renal artery constriction.

Another possibility is that the anti-hypertensive action of vitamin A may be totally unrelated to its specific vitamin effects and that one or more chemically related compounds with little or no vitamin action may prove to be more effective than vitamin A as hypotensive agents. Further work is being done to investigate this possibility.

Following are a few representative case summaries and charts of blood pressure variation under vitamin A treatment.

Case 1. Female, aged 68. No knowledge of hypertension until cerebral hemorrhage with transient hemiplegia occurred in March, 1943. B. P. was 190/110. She was given 200,000 units vitamin A daily. In April, 1943 B. P. was 130/80. Pressure thereafter remained entirely normal for six months and treatment was discontinued. In November, 1943 her pressure had risen again to 160/90. After resumption of treatment, B. P. fell to normal and remained normal on a maintenance dose of 100,000 U. daily.

Case 2. Female, aged 65. Hypertension was diagnosed in 1939. She was treated at regular intervals with potassium thiocyanate. Results were very mediocre and temporary. She started vitamin A treatment Nov. 1942, at which time pressure was 170/85. With treatment her pressure was reduced, over a period of four months, to 142/78. Patient then stopped treatment. One month thereafter, patient suffered mild cerebral hemorrhage with partial hemiplegia. B. P.

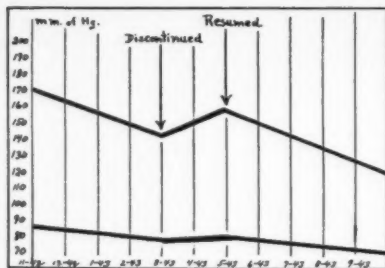


Fig. 2. Blood pressure chart of case 2.

was 168/80. Patient was again placed on vitamin A therapy and by Oct. 1943 pressure was 120/70. Since that time, on a maintenance dose of 100,000 U. daily, pressure has consistently remained at or near normal. There have been no symptoms since the hemiplegia.

Case 3. Female, aged 73. Had typical hypertensive symptoms. Her b. p. was 220/110 on July 7, 1943. On standard

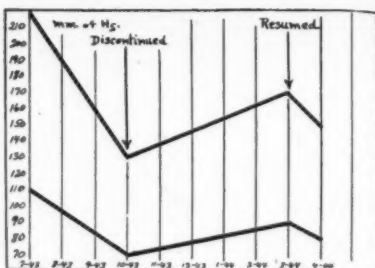


Fig. 3. Blood pressure chart of case 3.

course of vitamin A, pressure was markedly reduced each month until it reached a normal of 130/70 in Oct. 1943. All symptoms had disappeared at this time. Patient then discontinued treatment of her own volition. In March 1944 she returned, stating that her symptoms had returned several months previously. Her b. p. then was 170/90. Treatment was resumed. Two weeks later, pressure had been reduced to 150/80 and symptoms had again markedly improved.

## The Clinical Use of Anti-Coagulants\*

By COL. EDGAR V. ALLEN, M.C., Omaha, Nebraska

USUALLY the coagulation of blood is a helpful protective mechanism. In some cases, however, it clots too easily so that this protective mechanism brings harm, and possibly death in certain conditions:

- Thrombosis of brain or lung.
- Bland thrombosis of veins (phlebotrombosis).
- Arteriosclerosis obliterans.
- Arterial embolism.
- Thromboangitis obliterans.

### Dicumarol

Dicumarol has been used at the Mayo Clinic on more than 1,000 patients. Its physiological effects are:

1. A prothrombin deficiency, the extent of which depends upon the size of the dose and the individual patient's susceptibility.
2. Coagulation time may be prolonged; this test cannot be used as a guide to treatment, as it does not change with the prothrombin time.

\* Abstracts, by R.L.G., of a paper presented before the War-Time Graduate Medical Meeting, Fitzsimons General Hospital, Denver, Colo., by the Consultant in Medicine, Seventh Service Command, Omaha, Neb., Mar. 15, 1945.

3. Clot retraction is delayed.
4. The sedimentation rate is increased.
5. Platelet adherence may be decreased.

Long continued use: After 2 months administration, all examinations including liver function tests showed no pathological abnormality.

### Prevention of Intravascular Thrombosis

Dicumarol will prevent thrombosis and pulmonary embolism. Before it was employed, 18 percent of patients who had suffered one pulmonary embolus experienced another one which ended fatally. Since its use, only six tenths of one percent have suffered a fatal embolus.

**Thrombophlebitis:** The use of dicumarol has decreased the percent of total emboli caused by thrombophlebitis from 3 percent to none, in the last 138 cases.

Hysterectomies are notoriously followed by pulmonary embolism. The prophylactic use of dicumarol, beginning on the third postoperative day, prevented the occurrence of such emboli. Previously, 4 percent of patients had suffered pulmonary embolism and 0.7 percent died.

Medical patients likewise did not

experience thrombosis while taking Dicumarol.

### Dose

There is no fixed dose, as each patient responds differently to the drug. Daily prothrombin times, in seconds, must be taken to learn when the next dose is needed. From 24 to 72 hours are necessary for the drug to take full effect. After the drug is stopped, the anticoagulant action may last for several days.

The dose for one day is given at one time: First day, 300 mg. are given, the second day and each day subsequently, 200 mg., if there is greater than 20 percent of normal prothrombin time. No dose is given if there is less than 20 percent of normal. *Resistant patients* may require 300 mg. as a daily dose.

### Overdosage

If there is an excessive prothrombin deficiency (less than 10 percent on 2 successive days) or if bleeding occurs, give 60 mg. of menadione bisulphite (vitamin K) intravenously at once.

### Postoperative Prophylaxis

When used to prevent thrombosis and pulmonary embolism, it is begun on the third postoperative day, so that its effect will be present between the fifth and tenth days, the most dangerous time for the occurrence of emboli. It is given until the patient leaves the hospital, (also during the 4 days that the patient is ambulatory before leaving).

### Is It Dangerous?

Bleeding is the only complication. In our series, 2.5 percent of the patients had major bleeding, 4 percent suffered minor bleeding. Slight epistaxis and hematuria may be disregarded.

### Contraindications

Ulcerations along the gastrointestinal tract, renal or hepatic insufficiency, wounds including operative wounds (wait 3 days until firm clotting has taken place and organization is beginning), potential bleeding, continuous gastric or intestinal drainage indicate caution; absolute contraindications are purpura, blood dyscrasias with bleeding tendencies, and subacute bacterial endocarditis.

### Indications

Indications for dicumarol are: 1. thrombophlebitis, 2. lung infarct or embolism, 3. postoperatively for patients who have had previous thrombophlebitis or lung emboli, 4. post-traumatic patients who may develop thrombosis and embolism, 5. peripheral embolism, so

that no clot will form at the site of removal of the embolus, 6. after any operation in which damage has occurred to large arteries or veins and 7. to patients with cardiac failure and thrombosis to prevent pulmonary emboli.

### Questions

Is the Quick prothrombin test valuable? — It is the only gauge as to the effectiveness of the treatment and as to the dose required.

Will vitamin K Counteract dicumarol's action? — Large doses of K will cause the prothrombin deficiency to disappear in 24 hours (average). 60 mg. of vitamin K is given intravenously; more may be given up to 600 mg., if needed to restore normal coagulation.

What effect will a transfusion have? — Blood transfusions, 500 cc. of fresh (not bank), citrated blood will restore normal clotting promptly.

How can rapid anticoagulant action be obtained? — Give dicumarol orally, and 50 mg. heparin intravenously every 4 hours until the prothrombin time is 20 per cent of normal. Heparin gives a very rapid anticoagulant action but is very expensive and must be injected very often. Dicumarol is slower acting, but more prolonged.

### Deficiencies of Dicumarol

Dicumarol has no effect on a thrombus or embolus already formed. It may be used only to prevent the formation of fresh emboli. Its action is delayed for one or two days. Its use is restricted to a narrow zone, which must be determined by daily tests of prothrombin time, thus ruling out its use for long periods of time. There is a small risk of bleeding.

### Ligation of Veins

In the East, ligation of both femoral veins has been employed to prevent thrombi from extending into iliac veins and thence to the lungs. There is a higher mortality rate following ligation, than following dicumarol therapy. A permanent interference with venous return is produced by bilateral ligation. More important, such ligation prevents distal thrombosis from the legs only, as contrasted to dicumarol which prevents thrombosis all over the body.

### Discussion

Dr. W. Thorn, Professor of Medicine, Harvard University: *Recurrent episodes of "heart failure" in a known cardiac patient are often really recurrent pulmonary infarcts, precipitated by heart failure; some patients die unnecessarily because this is not thought of.*

# Editorial

## Kings Over Europe?\*

The citizens of the United States tend to believe that a republican form of government is necessarily a democratic one.

A republican government is a representative one, but is not necessarily democratic, as in the republic of Venice only influential people were represented, and Cromwell, the lord protector of England, set up a republican form of government, but dismissed those representatives in Parliament ("Rump" Parliament) who did not agree with his views.

Governments cannot be pigeon-holed as to their true worth, by calling them republican or monarchical. Look at England, and Scandinavia, for example. These governments have proved themselves flexible, and show that a monarchy may sponsor a democratic government.

Monarchies may be considered flexible or rigid in adjustment to changing times. The rigid types do not survive indefinitely.

After this war, the rigid monarchies may be revived, however. In Austria, for example, a Hapsburg descendant has already suggested a federation of little states along the Danube River which would retain their identity, but would be leagued together for protection, presumably under his monarchical government. The landed aristocracy have kept the peasants in submission so long that a background for a monarchy is present.

In Spain, Don Juan, the heir to the Bourbon throne, is at work. It has been said that the Bourbons "Never learn anything and never forget anything."

In Italy, the family of Savoy have remained in power for a long time. The king has survived Mussolini's rise and fall.

In Bulgaria, a five year old king is theoretically in power. Actually, the regent is the leader, and is a member of the Communist party. This strange combination of bed fellows is possibly due to Moscow's influence in Bulgaria's politics. Stalin may be the influence toward monarchy, as it is possible to dominate one individual easier than a party.

Post-war political chaos may be ex-

pected. Conservative citizens may make an appeal to "experienced persons," (dictators or kings) rather than to permit a new or untried form of government to rule. Thus, they will hope to avert chaos and possible loss of property.

These experienced persons who know the people of the country and their problems serve as a prelude to monarchy ("legitism").

If there is a restoration of the Hohenzollern family in Germany and the Hapsburg royal family in Austria, it will effect our future cooperation as restoration of the monarchies and may convince us that the democratic spirit is in the minority. However if this does occur, we should not stop working for the establishment of truly representative governments.

The royal families still believe in one-man rule, complete subservience to the state or totalitarianism, and the "divine right of kings." These royal families are working now to take the unthinking group of people along with them.

In southern Europe, the persons with governmental experience are the greatest enemies of democracy.

If the grandson of the Kaiser is returned to power, look to see the return of Prussian autocracy and the emergence of Germany as a military threat in another generation. This Prussian autocracy made up the chief cogs in the Nazi war machine. The Nazis could not have succeeded without these trained, ruthless, Prussian military leaders.

These monarchies may give a liberal constitution to the people but will see that there are many loopholes in it. They will gradually evade the liberal provisions of the constitution until complete monarchy is again established.

*Summary: The fight for democracy is long; a peaceable settlement must be the foundation. We can't expect to solve all the problems of the future at once.*

The restoration of the royal families will be the first sign of failure. We must then intervene to see that such power is only temporary.

♦  
If you would not be forgotten as soon as you are dead and rotten, either write things worth reading or do things worth the writing.  
—Benjamin Franklin.

\* Presented to the Lions Club, Trinidad, Dec. 6, 1944, by Morris Taylor, Instructor of History, Trinidad Junior College, Trinidad, Colorado. Abstracted by R. L. Gorrell.

## Preparation of Manuscripts

Many of the papers submitted to **CLINICAL MEDICINE** for publication are in a poor state of preparation, or are in such form that they require hours of work and retyping to make them fit copy for the printer. Believing that many authors would strive to improve their manuscripts if given brief directions from the editor's slant, the following suggestions are offered:

Examine every feature of the journal for which you are preparing your manuscript, and try to conform to its practices. Note the position of headings, general organization, and the methods of citing literature particularly, and bring your paper into conformity with the general architecture of papers published.

Do not crowd the material. Leave a three inch margin at the top of the first page, liberal side margins for editorial marks, and double spacing of lines so that there is space for any required editorial changes.

Send clean copy. If you find penciling necessary after the copy has been prepared, retype it and submit without penciling or pen corrections.

Identify your illustrations. Place your name and figure number on the back of each figure. Do not put legends into or on the figure, either front or back. Type all legends, properly numbered to correspond to the figures, on a sheet of your manuscript.

Do not edit the paper before sending it. Leave headings unscored, scientific names without underlining etc. The editors will take care of all these matters in accordance with the practice of the journal.

Place each table on a separate page; do not crowd too much material into a single table. Note the size of page (width and length,  $4\frac{3}{4} \times 7\frac{1}{2}$  in.) and gauge tables accordingly, leaving plenty of space in margins and in the interior for editorial marks. Use horizontal lines at top and bottom, not in interior of tables, and vertical lines between columns. Spaces (leads) are used to separate sets of data. For footnotes to tables, use the asterisk, dagger, double dagger, and section.

Acknowledgements are preferred at the end of the paper. The name of your institution and its address should be given at the end of the manuscript.

Use separate pages for the literature cited. Give complete citations, author, title, journal name, vol. no., inclusive pages, and year. (See any literature list in the journal for examples.) Punc-

uate according to the examples, and leave no citations incomplete.

Limit the size of all pages, drawings, tables, etc., to standard  $8\frac{1}{2} \times 11$  inches or less.

In general, use typewriter ribbons that are not too dry; send originals and retain a carbon copy to insure against loss, and to consult in case of need. We solicit your cooperation in this effort to relieve the editors and printers of some of their most serious and trying problems.

## Boxing for High Schools and Colleges\*

Boxing has been publicized as a valuable means of encouraging strength, endurance, quickness of response, aggressiveness, the art of self-defense, courage, and the ability to take punishment.

Nevertheless, many scientists, physicians, and coaches who have given serious thought to the subject have been led to oppose the sport in schools and colleges.

Most of the strength and endurance developed by the body is a result of the diet, rest, road-work, rope skipping, and other body-developing programs. These have nothing to do with boxing, and can be enjoyed in connection with other activities.

Boxing improves a man's ability in self-defense, but not as much as wrestling or jiu-jitsu.

The chief aim of boxing is to injure the opponent, and fear of losing or appearing to be a coward has often driven the bravest man to take injuries causing grogginess or dizziness and to continue fighting in a semi-dazed state when he is more likely to receive more serious injuries. In over forty fatal cases whose autopsies have been written in medical history the chief organ injured was the brain tissue, but of much greater significance are the injuries that lead only to such injuries as dizziness or amnesia.

All knowledge indicates that any serious head injury, even without skull fracture or knock-out, may be accompanied by pin-point hemorrhages and other brain injuries without any clinical signs developing at the time. Many boxers become "punch drunk" due to repeated brain injuries.

Boxing cannot be encouraged as a sport in schools or colleges.

\*By Arthur H. Steinhaus, Ph.D., Professor of Physiology, George Williams College, Chicago, Illinois.



# CLINICAL NOTES and ABSTRACTS

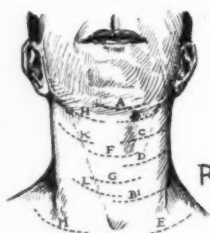
## The Placement of Incisions in the Neck

In a recent tour of surgical clinics, I was startled to see at two leading centers transgression of an old axiom that incisions in the neck shall not cross the normal creases of the skin. Vertical incisions for the excision of branchial cysts, or for the opening of cervical abscesses, should be viewed with an instinctive aversion by all surgeons.

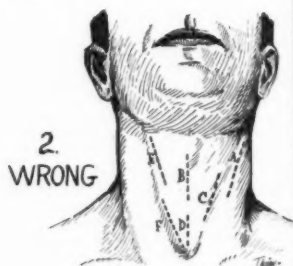
An incision that crosses the normal lines of the skin in a region characterized by constant motion as in the neck will almost invariably produce a thick ugly scar that is likely to become more prominent as time passes and that may even assume the character of a keloid. The placement of incisions in the neck, therefore, is particularly important in women, who may suffer untold mental anguish from badly placed incisions that produce keloidal scars in conspicuous and constantly self-observed areas.

Every effort should be made to place an incision for any of the operative procedures named in a crease of the skin, or paralleling a crease if necessity demands that the incision be placed where no crease exists. However, we have no hesitancy—except in draining abscesses—to reflect skin flaps either upward or downward for 1 or 2 centimeters more if thereby the incision can be made to coincide with a normal crease in the skin demonstrable before operation.

In the removal of a congenital sinus which presents in the neck above the clavicle and extends upward to penetrate the pharynx in the region of the tonsil, adequate exposure is easily obtained through two transverse incisions paralleling the skin creases (Fig. 1—B, and B<sub>1</sub>), and these should be used in preference to a vertical incision paralleling and following the sinus tract, as is so often advised. A temporary tracheotomy can be performed through a transverse incision (Fig. 1—G) with minimal



1.  
RIGHT



2.  
WRONG

Fig. 1. Proper types of incisions in the neck which parallel Langer's lines.

Fig. 2. Wrong types of incisions published in a new textbook of surgery.

residual scarring, whereas the scar of a vertical incision may be an aggravation forever to its possessor. The ligation of the carotid artery, whether common or internal, can be performed as readily through skin-crease incisions (Fig. 1—K, and L) as through incisions paralleling the sternomastoid muscle, and the scars after several months are almost undetectable. After the skin flaps are reflected, the muscle is retracted laterally and not divided. Similarly, branchial cysts, esophageal diverticula, carotid



body tumors may be removed through crease paralleling incisions permitting wide reflection of skin flaps and retraction of the muscle for adequate exposure. Incisions for the draining of cervical abscesses, wherever located, will heal with minimum scarring if placed parallel to the normal lines of the skin.

Careful closure of the platysma muscle with interrupted fine silk or cotton sutures is a necessary part of a non-scarring incision in the neck. Sutures closing the skin should be removed in 48 hours to avoid producing transverse scars and permanent cross-hatching at the site of each suture.

The reproaches of a sensitive woman should be avoided by the surgeon called upon to perform an operation in an area so interminably visible to her.—E. HOLMAN, M.D. in *Surg. Gyn. & Obs.* May 1944.

[Incisions on face, breast, chest, abdomen and extremities can be so placed that they follow natural creases or folds of the skin (Langers Lines). Healing is quicker, induration is much decreased and the scar is thinner and less visible.—Ed.]

### Liver Therapy for Uveal Tract Disease

The parenteral administration of liver extract has confirmed the utility of this therapeutic procedure in certain degenerative conditions of the uveal tract.

The procedure has been found useful in the treatment of pathologic progressive myopia (doliophthalmos), disseminated choroiditis and toxic amblyopia. There is some indication for its extensive and sustained application in certain patients with pigmentary retinosis.—ROBERT D. BARNARD, M.D., in *E. E. N. T.*, Oct., 1943.

### The Use of Drugs in the Treatment of Asthma

**Epinephrine (Adrenalin).** When a patient is younger than 35 and the onset of asthma was before or about the age of 20, the chances are good that the cause is not some intrinsic factor, but a hypersensitiveness to a food, dust, or drug (extrinsic factor). Inject a small dose of epinephrine subcutaneously. If the attack is relieved, further doses can be given while the patient is at home. If epinephrine has only a slight and transient effect, the patient should be removed to a hospital to escape the causative substance at home.

The dosage of epinephrine is important.

When the correct dose is given to the right patient, the asthma is relieved and no new symptoms develop. Epinephrine is effective only when the patient's symptoms depend on spasm of the bronchial smooth muscle. It will not stop the cough from bronchitis, with its mucus in the lumens of the bronchi; the dyspnea of heart disease, with its engorgement of the pulmonary blood vessels; or the dyspnea of organic emphysema, with its dilatation and coalescence of terminal alveoli. High blood pressure is not a contraindication provided bronchial spasm is present. A small dose—that is, 0.25 cc. of a 1:1,000 aqueous solution—is usually quite as effective as a larger one. Patients vary in this regard and some require larger doses. Begin with a small dose and increase it gradually until the desired effect is obtained. It may then be possible to reduce the dose. If the first dose is ineffective, a second may be injected in about 15 minutes. Such pairs of doses should be given not oftener than 2 hours apart. The intravenous injection of 1 liter of physiologic saline solution containing 1 mg. of epinephrine is useful in critical cases. Finally, too much epinephrine does more harm than good. If the patient has had repeated injections with no effect, the administration of further quantities may lead to serious difficulties.

**Ephedrine** is absorbed by mouth, and controls mild bronchospasm. Its action is slow, and the dose, 20 to 40 mg., should be taken after supper if the effect is to be obtained at bedtime. The commonest difficulty is that the drug causes sleeplessness; it may also cause palpitation and tachycardia.

**Aminophylline** is used intravenously with good effect in asthma. The dose of 200 mg., dissolved in 10 cc. of distilled water, comes prepared in ampules. A larger quantity, up to 400 mg., has not been more effective. Severe and dangerous reactions have not been described. Oral administration is of questionable value.

**Water, Salt, and Sugar.** Almost all patients with severe symptoms that cannot be easily controlled should be given an intravenous injection of normal salt solution, usually containing 5% glucose; 1,500 cc. or more are allowed to run in with fair speed. In most cases, the effect is prompt and satisfactory. Hypertonic glucose solutions have been advocated; 5% glucose intravenously has usually given good results.

**Other Drugs.** In the use of potassium iodide, more stress has been laid on the

iodine radical. Now, however, there is evidence that the potassium may be important since potassium chloride has benefited some patients. Ether (30 cc.) in olive oil (30 cc.) may be injected slowly into the rectum 1 to 3 times a day as necessary. An ampule containing 1 cc. of ether and 1 cc. of peanut oil injected intramuscularly has been found to be useful. Niacin has been used in doses of 100 mg. intravenously and 200 mg. orally with benefit. So far, the results with the sulfonamides are not encouraging. Asthma does not depend on an acute infectious process. Insulin, sodium thio-sulfate, amino acids, and dilantin sodium have been advocated recently.

**Drug Allergy.** Aspirin may be effective in asthma, but it should never be given without inquiring carefully whether the patient has ever had any trouble from the salicylates. Barbiturates of all kinds are in a similar category. A hypersensitivity to them may be present. Morphine should never be given in asthma. It can actually cause bronchospasm. Furthermore, in severe asthma when the patient is gasping for breath, depression of the respiratory center may be the last straw.—F. M. RACKEMANN, M.D., in *New Eng. J. Med.*, Sept., 1943.

### Current Comment

**Nose drops:** Acceptable nose drops must have a pH of 5.5 to 6.5, be isotonic to nasal tissue fluids and must not interfere with ciliary beat. (Ask your pharmacist or drug house about such preparations).

**Alcohol as a germicide:** Ethyl alcohol, 70 percent by weight (70-80 percent by volume) is 30 times as effective as a germicide than the 80 percent by weight.

**Blood donors:** Blood donors should not be bled more often than once in every 3 months, in the average case, as repeated donations at shorter intervals may deplete the plasma protein as well as result in anemia.

**Glove dusting powder:** Potassium bitartrate, a bacteriostatic substance, may be a safe and satisfactory dusting powder for rubber gloves.

**Keep milk out of sunlight:** Exposure of milk to direct sunlight for an hour or more destroys most of the riboflavin (vitamin B<sub>2</sub>).

**Temperature following exercise:** Following exercise, rectal temperature may rise 1 to 4° F., while oral temperature shows little change.

**Vitamin C from pine needles:** A decoction made from pine needles will prevent scurvy.—*Hospital Corps Quarterly*, U.S. Navy, May 1944.

### Childhood "Nervousness"

Anxiety can often be traced back to childhood, just as we trace physical disease, such as a mitral valvular lesion, back to its beginning with an attack of acute rheumatic fever.

Anxiety in childhood is diagnosed by behavior or adjustment difficulties. (Edward Weiss, M.D. in "*Psychosomatic Medicine*," published by W. B. Saunders Company).

When a parent brings in a child with the complaint that "she is so nervous she cannot stay in school," think, do not give sedatives after performing a perfunctory physical examination.

The parents feel, of course, that the cause must be a physical one, so a thorough physical examination should be carried out, most of which can be done while talking to the child and listening to the parent.

The child reflects his environment and attitude of his parents. The nervous mother and irritable father are duplicated in their offspring. Many nervous children, who later in life are labeled as "psychoneurotic," are the product of an unhappy, insecure home in which the parents quarrel, are separated, or divorced.

The concept of both physical and emotional illness must be kept in mind, at all times, or cases of chorea will be missed. — EDWARD WEISS, M.D., from *Psychosomatic Medicine*, W. B. Saunders Co.

### Newer Treatment of Typhoid Fever

106 consecutive cases of typhoid (enteric fever) were treated with only 2 deaths, as compared to an average of 15 percent mortality rate.

**Bleeding** is a common complication of typhoid (epistaxis, intestinal hemorrhage). Bleeding and clotting times are normal in typhoid, but blood platelets (thrombocytes) decrease sharply in number very early in the disease. Every typhoid patient is a potential bleeder.

### Treatment

Vitamin C (1) cements endothelial cells of capillaries and thus decreases permeability of capillaries, (2) stimulates bone marrow to produce more platelets, (3) has a coagulation promoting effect, (4) raises production of antibodies, (5) heals ulcers, and (6) may be given in doses of 1,200 mg. daily without toxicity; (400 mg. parenterally, 800 mg. orally).

Adrenal cortex extract is also injected daily in doses of 5 to 10 cc. in very toxic

patients. As a routine and emergency measure, it is life saving.—J. DRUMMOND, M.D. in *Proc. Cape Town Med. Assoc.*, Aug. 1943.

### Hormonal Effects on Growth in Children

One hundred twenty-five children with growth retardation, cryptorchidism, adipo-genital dystrophy, hypogenitalism, hypothyroidism, simple obesity, malnutrition, mental retardation, behavior problems, and menstrual disturbances, were treated with appropriate hormones in accordance with accepted indications.

The effect on growth rate in the several conditions enumerated, with the amount of each of the preparations used, is shown in the accompanying table:

Therapy	No. Cases	Ages in Years	Average Dosage	Duration	Growth Rate	Other Effects
1. Thyroid	24	4 to 16	¼ to 3 gr.	4 mo. to 24 mo.	Increased 58% (14 cases) Maintained 42% (10 cases)	1. Loss of weight 2. Improvement in texture of skin 3. Mental alertness 4. Social adjustment improved
2. Anterior pituitary growth extract	21	6 to 17	1 to 2 cc. 2 or 3 times a week	2 mo. to 24 mo.	Increased 23.8% (5 cases) Slight increase 19.1% (4 cases) No change 57.1% (12 cases)	1. Improvement in general well-being 2. Occasional gain in weight
3. Chorionic gonadotropin	59	3½ to 17	500 I. U. 2 to 3 times a week	2 mo. to 24 mo.	Increased 62% (31 cases) Maintained 30% (15 cases) No change 8% (4 cases)	1. Improved genital development 2. Improved muscular tone 3. Improved mental alertness 4. Improved social adjustment 5. Reassurance 6. Loss of Weight
4. Testosterone Orally	21	8 to 18	10 mg. once daily	1 mo. to 4 yrs.	Increased 81% (17 cases)	1. Improved muscular tone 2. Improved vitality 3. Reassurance 4. Gain in weight 5. Rapid growth of genitalia
Parenterally			10 to 25 mg. 1 to 2 times a week		Maintained 19% (4 cases)	
Implantation			150 to 450 mg. pellets every 6 months			

### Fetal Distress During Labor

Active treatment of fetal asphyxia has usually consisted of dragging the asphyxiated infant out of the uterus by the heels or with forceps. The depressed centers are further depressed by general anesthesia and trauma. Frequently overlooked is the more subtle and less traumatic method of bringing the oxygen to the infant by the administration of this gas to the mother.

The rate and rhythm of the fetal heart give the most satisfactory and direct clinical method for evaluation of the fetus during labor. Most infants in utero have an individual, basic rate which may vary from 115 to 170 per minute. The characteristic fetal cardiac response to oxygen deficiency may be: (1) A rather sudden decrease in the rate, usually from 30 to 40 beats per minute, which persists throughout uterine contractions and the subsequent intervals, or (2) a

gradual or irregular slowing of the rate over a period of 3 or 4 minutes to a level below 100.

Elaborate equipment is unnecessary for such treatment, the minimum being a tank of oxygen, a reducing valve and a rubber tube. The addition of a face mask is helpful. One hundred per cent oxygen may be given continuously or if inhalation analgesia is being used, the oxygen should be administered with the agent and during the interval between contractions as well.

The success of oxygen therapy may be measured by the improvement of the heart rate. Response is usually rapid but unless notable improvement in the fetal heart rate is present within 5 to 10 minutes, one may assume that oxygen administration will be of no value. It is apparent that such a procedure does not increase the hazard for the infant inasmuch as at least 5 or more minutes usually elapse during the preparations for delivery. If the heart fails to improve exigent delivery is indicated when possible. If the heart improves, labor may be allowed to proceed in a normal manner.

We are very hesitant in performing any type of operative delivery while the mother and fetus are in acute oxygen want. As a general rule, treat the oxygen want first and then proceed with delivery. Certain qualifications of this statement are necessary—if the existing anoxic state is obviously irreversible there is no justification for unnecessary delay, or if fetal asphyxia is impending or developing at a moment when delivery is about to be completed there should be no delay in completing the delivery.

Occasionally a general anesthesia of the mother may be of great assistance in improving the fetal heart rate, particularly when uterine contractions have been unusually vigorous. When such a procedure is contemplated, the anesthetic agent of choice should be one which permits a high concentration of oxygen such as ether or cyclopropane.

Finally, at the moment of birth an important bit of technic may be of benefit to the baby. Immediately after the head has been born the anesthetist can give the mother oxygen in high concentrations and this procedure should be continued until the cord has ceased pulsating or until the infant has breathed. This is the last effort that we may make to insure the maximum oxygenation of infant as it begins its extra-uterine life.—C. J. LUND, M.D., in *Ill. Med. J.*, Sept. 1943.

## Mailing Blood Specimens

**DAMAGE TO THE BLOOD SPECIMEN:** The most common cause of damage to the blood specimen is hemolysis, which frequently renders the blood unsuitable for testing. Hemolysis most frequently is caused by the use of a syringe which contains some water or alcohol. Also, if blood is overheated or frozen, hemolysis may result. Bacterial contamination will hemolyze blood if it is kept at room temperature too long. Another cause of hemolysis, which is often overlooked, is that of ejecting blood too forcefully through the needle, which ruptures the red blood cells.

**Preventive measures:** 1. Always use a dry syringe, or one which is nearly dry, especially when drawing small quantities of blood.

2. Keep blood in the icebox until just before mailing.

3. Do not mail blood if it is likely to stand in the mail over the week-end or a holiday.

4. In very hot or very cold weather, try to mail the blood just before mail time.

5. Use sterile precautions in collecting blood and placing it in the container. Always use a sterile container.

6. Expel the blood from the syringe slowly, especially if the needle is of small gauge.

## BREAKAGE OF THE CONTAINER:

Usually breakage is due to improper packing of the test tube containing the blood. The stopper may be too loose and may be forced out by the splashing of the blood or by the expansion of the air in the test tube, or the stopper may be forced in too tightly, thus splitting the mouth of the tube. If blood is sent by air, it will almost certainly leak if it is placed in the customary corked test tube, due to the lower atmospheric pressure at high altitude and the consequent expansion of the air in the tube.

**Preventive measures:** 1. Always use a regular specimen-mailing container if it is available. Laboratories will supply these on request. If such a container is not available, use a very rigid cardboard, wooden, or tin box which is much larger than the enclosed test tube, and use plenty of packing.

2. Be sure that the lid of the mailing container is screwed on securely and that it fits properly.

3. In closing the container, be sure that the top may be screwed on without forcing the bottom of the test tube against the bottom of the container, and

also see that some of the packing separates the tube from the bottom of the container.

4. Fit the cork in the test tube snugly, but not too tightly. Inverting the tube will cause the blood to flow in between the cork and the glass, and this makes a satisfactory seal.

5. Be sure that there is no crack in the lip of the test tube, and that the bottom of the tube is not defective.

6. When sending blood by air mail, use a vial or small bottle with a screw top, so that changing atmospheric pressure cannot force the stopper from the tube.

**CARELESS LABELLING:** All too often specimens are sent to the laboratory without all the necessary information concerning the patient, and the physician, and the test which is requested. Another common fault is the use of fictitious names. Sometimes there is no indication to show what test is required, and often no return address is given. At times the cancellation of the stamps will obscure the address and name of the sender, and frequently the enclosed data slip is illegible.

**Preventive measures:** 1. Enclose all pertinent data with the specimen. Do not send this material in a separate letter because the specimen and the letter may not arrive at the same time.

2. Label the container carefully and legibly, and place the return address on the inside as well as the outside of the container.

3. Give the patients full name, and do not use fictitious names.

4. State clearly what test is desired.

The observation of these simple precautionary measures will prevent most of the accidents which result in the loss or destruction of blood specimens which are being sent through the mail. A few extra minutes spent in careful drawing, recording and mailing, will often save long and inconvenient delays with their subsequent disappointments and confusions.

### Thiocyanate for Hypertension

We are of the opinion that thiocyanate should not be administered to hypertensive patients for the purpose of lowering blood pressure, because, apart from its toxic effects, its influence is not striking in either the frequency or extent of blood-pressure reduction; that almost any medical or psychotherapeutic measure may be expected to yield results equally effective and with no element of danger.—WILLIAM GOLDRING, M.D., in *Bull. N. Y. Acad. Med.*, Sept., 1943.

### Recent Advances in Ophthalmology

Sulfathiazole is the most effective drug in *gonorrheal conjunctivitis*. It is given both locally and orally. A five percent solution of sodium sulfathiazole is instilled in the eye four or five times daily. A concentration of at least 6 mgm. percent must be maintained in the blood stream or the gonococci will become resistant to sulfathiazole. Babies can tolerate larger doses than adults.

In the early stages, *trachoma* can be cured. Sulfanilamide is the most effective; it is given in large doses and for a short period, rather than in small doses and over longer periods.

*Iritis* responds to oral sulfonamide.

*Corneal ulcers* should be treated with local and oral sulfonamide.

*Blepharitis* should be treated by local application of sulfonamides.

Patients with *squint* should be referred to the ophthalmologist at the age of one year. Treatment between the ages of 1 and 4 years is given to prevent loss of vision in the squinting eye from disuse. The use of both eyes in focusing together (binocular fusion) is established between the ages of 4 and 6, so that orthoptic exercises are given during this period, unless the degree of squint is over 20°. If exercises and glasses fail to straighten the eyes, operation should be considered at 5 or 6 years of age.—P. H. CASE, M.D., in *Southwest Med.*, Dec., 1943.

### Breasts P.R.N.

Breasts may be built up to order. Skin-fat-fascia transplants are used. Insufficient breast tissue, either congenital or subsequent to amputation, abscess or trauma, may be restored to a desirable contour by use of a fat graft covered with a layer of skin on one side and with fascia at the base. The lateral section of the gluteal area is a good donor site; the amount of fat transplanted should be slightly more than is required, to allow for absorption.

The skin with the nipple attached is extensively undermined to form a pocket large enough to hold the graft without tension, the pocket being formed over an existing scar or in the inframammary fold. After the graft is carefully placed in the dry pocket, the incision in the skin is closed with fine interrupted silk sutures, without drainage, and a dressing of large pieces of gauze applied. The pectoral area should be immobilized for one week.—Morton I. Berson, M.D., in *Surgery*, Mar. 1944.

### Thyroid Therapy of Premenstrual Distress

The use of tolerance doses of thyroid extract tablets taken regularly for a period of several months will relieve premenstrual distress in a large percentage of cases. Premenstrual headache and nervousness respond best.

The patient is started with a dose of 1 grain daily. This is increased to 2 grains, if relief does not result, and higher until palpitation, nervousness or tachycardia indicates that the dose must be reduced.—A. P. HUGGINS, M.D. in *Med. Times*, Sept., 1943.

### Surgical and Medical Prepayment Plans

Even at the risk of over-simplification, here is a comprehensive outline of the principal types of medical and surgical prepayment plans now in operation or under consideration in various states.

Type	Where Instituted	Remarks
I. <i>Service</i> — Covers surgical, obstetrical and medical service in hospital and some emergency surgical and medical service outside hospital. State society would form own Mutual Insurance Company. Has income limits for those who may participate — acts as indemnity plan for those insured above those limits.	Michigan New Jersey California	State organization would have its own separate Board of Directors, but all administrative details and selling is done by Blue Cross organization.
II. <i>Indemnity</i> — Covers surgical, obstetrical, and medical service in hospital. State society to form own Mutual Insurance Company.	Under consideration in Indiana	
III. <i>Indemnity</i> — Covers surgical, medical, and obstetrical care in hospital.	Connecticut	Fees and details to receive final approval by Connecticut State Medical Society. Policy to be written by commercial company.
IV. <i>Indemnity</i> — Covers surgical, medical, and obstetrical service in hospitals — work with the Blue Cross Plan by commercial company especially created to do this.	Under consideration in Wisconsin, Cincinnati and other places by Blue Cross	State society to have control over medical and surgical features of plan in method to be determined by it.
V. <i>Indemnity</i> — Covers surgical, medical, and obstetrical services in hospitals.		Commercial company approved by medical society, but physicians have no voice in its operation.
VI. <i>Indemnity</i> — Stock insurance company organized to write medical coverage on a cash indemnity basis.	To be presented to Council of Ohio State Medical Association on November 12, 1944, for approval	Control of company to reside in the medical profession of Ohio. Blue Cross of Ohio will be asked to cooperate.
VII. <i>Indemnity</i> — Field left open to commercial companies without any voice in procedure by the Indiana State Medical Association or the Blue Cross.		

Definitions: "Service" means that payment will be made direct to physician.

"Indemnity" means that payments are made to the patient.

This does not include plans that are operated in cooperation with the government, such as are in effect in Rhode Island and planned for New York City.

—J. Indiana M.A., Nov. 1944

### Emotional Disturbances of Children in War Time

There is no difference between the character of emotional disturbances in wartime and in peacetime. The children who would have emotional disturbances in peacetime probably would have them in wartime, plus the children, who would just have managed to avoid them in peace, succumb to them because of the greater variety and intensity of the causes during war.

The inability of children to make a satisfactory adjustment manifests itself by: (1) bodily symptoms, such as bed-wetting, loss of bowel control, vomiting, sleep-walking and various habit spasms, (2) neurotic reactions, such as various anxiety states and hysterical manifestations, and (3) various social behavior disturbances, such as lying, stealing, abrupt changes of behavior, destructiveness, aggressiveness and submissiveness.—HENRY HELMHOLZ, M.D., in *Minn. Med.*, Jan. 1943.





# DIAGNOSTIC POINTERS

## Allergy to Two Foods

• The food that is causing allergy may be identified by (1) taking a fasting white blood count, (2) feeding the suspected food, (3) taking hourly white blood counts for two to four hours. A decreased number of white cells (leukopenia) indicates that the food is a cause.

Occasionally, a patient may be sensitive to a combination of foods, but not to either individually. Beef and eggs caused one patient severe abdominal crampy pains and resulted in leukopenia, yet neither alone had any such effect. All skin tests (scratch and intracutaneous) were negative.—J. M. FENNER, M.D., *South Med. & Surg.*, July, 1944.

## Lipoma

• The encapsulated subcutaneous lipoma found on the trunk, or the trunk end of a limb, is recognized with ease by its doughy solidity and by the dimpling of the overlying skin when this is made tense by manipulation.—Am. J. Surg., July 1944.

## Rumbling Murmur

• A continuous, rumbling or machinery-like murmur may be due to a patent ductus arteriosus. The murmur is widespread and is loudest over the pulmonary area. This congenital defect has been successfully closed by surgical means in a large number of cases—R. E. GROSS, M.D., in *Med. World (London)*, Mar. 31, 1944.

## Significance of Sneezing

• Sneezing points to an allergic rhinitis (vasomotor rhinitis or hay fever) or to the onset of an acute upper respiratory infection.—F. L. WELLS, M.D., in *Med. Clin. N. Am.*, Sept., 1944.

## Anal Pain

• In a case of anal pain, if there is no abscess, no acutely inflamed hemorrhoid and no thrombotic hemorrhoid, almost certainly a fissure is present.—W. J. MARTIN, M.D., in *South Med. & Surg.*, May, 1944.

## The Under Par Child

• An anemic, underweight "delicate" child is often discovered in a routine examination to be having low grade fever, a cardiac murmur, choreiform movements of his extremities or some other rheumatic manifestation previously unnoticed. Usually present are hypertrophic reddened tonsils, tonsillar remnants or islands of lymphoid tissue on the pharyngeal wall, with redness extending to the soft palate and surrounding structures and slightly enlarged cervical nodes diffusely present on both sides, yet without any complaint of sore throat. From the start, there is an increase in the sedimentation rate. As the disease progresses, this becomes almost an indispensable aid in gauging the activity of the rheumatic process, as it usually outlasts the fever and leukocytosis.—P. S. RHODES, M.D., in *Wis. Med. J.*, Feb., 1944.

## Chronic Prostatitis

• In chronic prostatitis there is no residual urine; cystoscopy shows no intravesical projection of the gland and urine analysis determines the nature of the infection.—*Amer. J. Surg.*, July, 1944.

## Colonic Cancer vs. Pernicious Anemia

• Cancer of the colon, especially of the cecum and ascending colon, may result in a blood picture resembling pernicious anemia. Both diseases tend to come on at the same age, and achlorhydria may be present in both. Occult blood is found in the stools in colonic cancer in many cases, and the neoplasm may be palpable. X-ray examination is often required.—*Med. World (Lond.)*, Apr. 28, 1944.

## Nervous Breakdown

• The common symptoms which herald a nervous breakdown in business men are given as: A sense of impaired health and energy, getting up tired in the morning and wearing out by noon; insomnia; increasing irritability; and faintness, giddiness or a chilly feeling. Such symptoms indicate that he is on the verge of a nervous breakdown and so he should give up work at once and take a rest. If he does not, any little cold or accident will take him over the edge.—W. C. ALVAREZ, M.D., in *Med. World, (Lond.)*, May 5, 1944.



# THUMB

## THERAPEUTICS

### Vernal Conjunctivitis

• This obstinate disease can be alleviated by bathing the eyes in hot boric acid solution, and applying a 1 or 2 per cent ointment of ammoniated mercury to the fornix, or, if preferred, a solution of weak acetic acid, 10 to 20 drops to the ounce.—*E. E. N. T. M.*, Sept. 1943. (Cauterization of the nodules on the conjunctiva will relieve or cure.—*Ed.*)

### Don't Bathe Newborn Babies

• Bathing is best omitted during the neonatal stay in the hospital. Vernix caseosa left undisturbed constitutes an efficient and far more satisfactory bacteriostatic and probably bactericidal agent than any of the so-called antiseptic baby oils. More important, omission of quite ridiculous bathing rituals in this age period automatically reduces the amount of handling and exposure for each baby, saves valuable nursing time better spent in more essential occupations, and removes a large hazard responsible for many minor or serious accidents.

It is our feeling that the practice of leaving the vernix intact is one of the most direct and practical means of reducing frequency of impetigo and all other infections which can be attributed directly or remotely to excessive handling. In the majority of babies so managed, the skin soon develops a rather dry scaly appearance as the vernix "wears off"; nurses become accustomed to this and can immediately correct it when they administer the first formal bath on the day of discharge—oil, or soap and water if indicated.—*South. Colorado Bull. Phys.*, Mar. 1, 1945.

### Dysmenorrhea

• Pavatrine\* abolishes uterine tetany and decreases the amplitude of uterine contractions. The pain of dysmenorrhea is relieved by pavatrine. Atropine, ephedrine, adrenalin, alcohol and calcium gluconate have no effect on uterine contractions during menstruation.—*W. BICKERS, M. D.*, in *Virginia M. Monthly*, Aug. 1942.

\*G. D. Searle Co.

### Dover's Powders for Intestinal Parasites

• Five grains of Dover's powders given every 4 hours for 20 doses apparently cures many patients with intestinal parasites (ascaris, dibothriocephalus latus).—*J. O. GEORGE, M.D.*, in *Northwest Med.*, June, 1944.

### One Dose Sulfathiazole Treatment of Gonorrhea

• The patient, in the presence of the physician, swallows sixteen 7½ grain tablets, one at a time with a little water, in about two or three minutes. In this way, a total dose of 8 Gm. (120 grains) is given at once. The patient is permitted to be ambulatory; he is told to report daily for urinalysis and clinical inspection. Eighty-two per cent of patients with gonorrhea are relieved symptomatically. — *A. JACOBY, M.D.* in *Am. J. Syph., Gon. and Ven. Dis.*, July 1944.

### Swimming Sinusitis and Otitis Media

• The sinusitis and otitis media caused by swimming may be severe. The usual offender is the staphylococcus. Sulfonamide or penicillin treatment should be started at once.—*F. L. WEILLE, M.D.* in *M. Clin. North America*, Sept. 1944.

### Lemon Juice for Hay Fever

• Lemon juice has been effective in some cases of hay fever. Vitamin C (ascorbic acid) has not been effective.—*L. E. HOLZ, JR., M.D.*, in *J. Omaha Mid-West Clinical Soc.*, Aug. 1944.

(There is a persistent rumor among the laity that allergic manifestations, especially hay fever and asthma, respond to a citrus fruit diet. No carefully followed cases can be found.—*Ed.*)

### Urethral Dilatations for Urethritis

• Non-specific urethritis responds well to dilatation of the urethra with sounds at intervals of 4 days. A number 20 French sound is used at first, a number 22 next and so on until a number 32 F. has been passed.—*B. SEID, M.D.* in *Urol. & Cutan. Rev.*, Mar., 1944.

# NEW BOOKS

Any book reviewed in these columns will be procured for our readers if the order, addressed to **CLINICAL MEDICINE**, Waukegan, Ill., is accompanied by a check for the published price of the book.

## SURGERY OF THE HAND

**Bunnell**

**SURGERY OF THE HAND.** By Sterling Bunnell, M.D., Honorary Member of American Academy of Orthopedic Surgeons; Member of American Association of Plastic Surgeons and of American Society of Plastic and Reconstructive Surgery; Licentiate of American Board of General Surgery and Plastic Surgery. Published by J. P. Lippincott Co., 1944. Price, \$12.00.

This book is of interest to all surgeons who must operate upon the hand, plastic surgeons, neurosurgeons (because of sections on nerve injuries and repair.)

Contents: comparative anatomy, the normal hand, examination of the hand, reconstruction of the hand, skin and flexion contractures, bone, joints (why finger joints stiffen, preventing finger joints from stiffening, mobilizing stiffened joints and surgical repair), nerves, tendons including procedures, tendon grafts and transfers, repair, intrinsic muscles of hand, arm in relation to hand including brachial plexus injury and repair, malunited Colles fracture, injuries of the hand, wounds of all types, amputations, burns, tendon ruptures, fractures and dislocations of the hand, infections of the hand, the hand in industry, congenital deformities, vasomotor and tropic conditions, and tumors of the hand.

The author is tremendously interested in this field and makes the reader become so, as he sees results that are far superior to those obtained previously. Sufficient details are given so that the procedures become clear, especially in tendon suture, and other technical procedures.

There are many illustrations of excellent teaching quality. It is an encyclopedia of material on reconstruction of the hand that will be a landmark in surgical history.

## THE SECRET DESTINY OF AMERICA

**Hall**

By Manly Palmer Hall. First Edition. Published by Philosophical Research Society, 1944. Price, \$2.00.

This book is of interest to those interested in the occult and those with open minds on metaphysical problems.

The contents take up such subjects as: The origin of the democratic ideal; the world's first democrat; westward ocean travel to the earthly paradise; the first election of lawmakers; the ancient league of nations; a Roman project to give rulership to the wise; the democratic tradition preserved by secret societies; a new identity for Christopher Columbus; the prophecies of Nostradamus; the design of utopia; the objective of the secret society; western culture a thousand years before Columbus; Bacon's secret society as set up in America; a prophecy written in the year of Washington's birth; the unknown man who designed our flag; Thomas Paine and the rights of man; the unknown who swayed the signers of the Declaration of

Independence; the symbols of the great seal of the U.S.; the prophetic dream of General McClellan; and the end of the quest.

The author's works are always interesting and stimulating, as he is an outstanding occult philosopher and metaphysician who has traveled widely.

## INTRACRANIAL ARTERIAL ANEURYSMS

**Dandy**

**INTRACRANIAL ARTERIAL ANEURYSMS.** By Walter E. Dandy, M.D., Adjunct Professor of Surgery, Johns Hopkins University. Published by Comstock Publishing Company, Inc. (Cornell University) 1944. Price \$2.50.

Here is assembled for the first time, a series of cases of aneurysms of the brain with details on their surgical treatment. Beautiful sketches show the many types of cerebral artery distribution, especially those making up the circle of Willis. Successful and unsuccessful cases are described, and in many cases, illustrated. The author, a master neurologic surgeon, is entirely frank in his discussion.

## THE PROBLEM TEACHER

**Neill**

**THE PROBLEM TEACHER.** By A. S. Neill, Director of "That Dreadful School." Published by International University Press, 1944. Price, \$2.50.

This book is of interest to teachers who like to think, teachers who wish to improve themselves and their students (medical instructors would do well to digest portions of this small text), teachers who have a feeling that some thing is wrong with the way they are teaching.

Its style is refreshingly easy, full of original and striking thought. Although one may not agree with some of the author's views on capitalism and sex repression, one cannot help but think.

## TEXTBOOK OF PATHOLOGY

**Bell**

**A TEXTBOOK OF PATHOLOGY.** Edited by E. T. Bell, M.D., Professor of Pathology, University of Minnesota, Minneapolis, Minnesota. Fifth edition, enlarged, thoroughly revised. 448 engravings, 4 colored plates. Published by Lea and Febiger, 1944. \$9.50.

This book is of interest to pathologists, physicians and surgeons interested in study of abnormal body tissues, and medical students.

Its contents include: Predisposition to disease; mechanical injuries; injuries due to physical agents; injuries due to chemical agents; vitamin deficiencies; circulatory disturbances; retrogressive tissue changes; in other chronic infectious diseases; mycoses; inflammation; tuberculosis; venereal diseases, acute infectious diseases; tumors; diseases of the blood, thymus, lymph nodes, spleen; diseases of respiratory system, digestive system; pancreas, liver, gall bladder, heart, blood vessels, urinary system, reproductive organs, and ductless glands; neuropathology; bones and joints.

There are many good illustrations of microscopic pathology (both photographic and sketch), a number of clinical photographs of value, a few of gross lesions and tissues.

It is practical, and concise throughout with emphasis toward the clinical applications of facts presented.



## LET'S GET THE ADMIRAL HIS HORSE!



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**Admiral Halsey** has his eye on a fine white horse called Shirayuki.

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